The Builder.

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*Engineering Education.**

THE Council of the Institution of Civil Engineers have rendered valuable service to the country by the publication of a volume on the training and *status* of civil engineers in the United Kingdom and in foreign countries. No name is annexed to the work as that of responsible editor; an inconvenience which may be thought to be counterbalanced by the authority given to its statements, as being put forth by the Council of the Institution. The sources of the information as to professional education abroad (many of them well known and respected in this country) are severally stated, and the opinions of Englishmen of more or less eminence are extracted in a separate part of the work. There is not, however, any such summing up of the evidence, or delivery of the mature recommendation of the Council on the important subject which they have illustrated, as might have advantageously closed the work. We are rather furnished with materials for comparison and for meditation, than with any original contributions on the part of the Institution to the solution of the all-important question of technical education.

Honestly and fairly the work is admitted, on the first page, to be the result of alarm, and to be undertaken with a view to self-defence. "Technical education in this country," it is remarked, "was stated, a few years ago, to be so much inferior to that in other European States" as to threaten seriously the industrial interests of Great Britain." . . . "The Council of the Institution of Civil Engineers felt it their duty to interest themselves in that part of the inquiry which bore upon their own profession." "They resolved that it would be highly desirable in the first instance to obtain, from the most direct and authoritative source, full information as to the system adopted for the education and technical training of engineers, and generally as to the status of members of the profession in various foreign countries where this profession had assumed an important position." Somewhat late in the day, then, the replies to the inquiries on the first head are now brought before us. The subject of Continental engineering education is illustrated in some detail, although the very important question of the preliminary training of the student is left out of sight. Few persons whose views on the subject of education are based on exclusively English experience are aware of what is required, for instance, for the *entrance* examination into those institutions,—such as the *École Polytechnique*,—a three years' course in which is an indispensable preliminary to the *commencement* of a special course of three years more, in the exclusively engineering colleges, such as the *École des Ponts et Chaussées* and the *École des Mines*.

The portion of the work which we recommend every reader first to peruse is that containing extracts from Mr. John Scott Russell's volume on Technical Education for the English people, which closes the third part. The mild tone in which the Council of the Institution speak of the menace to our industrial interests finds an echo of portentous significance in the practical statements of Mr. Russell. "It is notorious," says that gentlemen, "that those foreign railways which have been made by themselves (*sic*) in the educated countries of Germany and Switzerland have been made far cheaper than those constructed by us in England; it is known that they have been made by pupils of the industrial schools and technical colleges of those countries. . . . The experienced traveller can read as he travels the work of a superiorly educated class of men. . . . We everywhere feel that we are in the hands of men who have spared no pains, and who have applied high professional skill to minute details." The works of the foreign railway stations, the comfort and convenience of the carriages, the economy in capital outlay, and the amount of net revenue,—every element of comparison except speed,—are contrasted with our own to the disadvantage of the latter.

In marine steam-engines, Mr. Russell—and none can doubt his competence as a judge in this respect—tells us that we are "equalled, if not beaten." The large marine-engine of Dupuy de Lôme, exhibited at Paris in 1867, "would consume less fuel, do more work, endure longer, and run less chance of accident than our engines; all of these being qualities heretofore constituting our own superiority. The iron armour of the French ships is stated to be equal to our own; the artillery superior; the French having obtained that which we had failed to obtain, after an enormous outlay—"efficient breech-loading guns, which enable them effectually to deliver seventeen shots to our ten." Mr. Russell would no doubt have added, if his work had been more recently published, that the iron-clad ships of the French navy, as a rule, are constructed to swim with the deck upwards, and not to turn over like a turtle, and go to the bottom like a shot. The advantages of the technical education of the French shipwrights compared with that which in some parts of this country, and even in some pages of the work before us, we find to be boasted as "practical," never had a more pregnant illustration than in the fate of that supreme effort of our private dockyards.

In land steam-engines, economy of boiler power, advantageous application of steam, and superiority in mechanical contrivance, enable the French engine-wrights "to get more power out of a given quantity of fuel in a higher proportion even than the greater cost of our own fuel exported into France." In rails, railway wheels, tyres, and axles; in large wrought-iron beams; in frames for ships; in plates and bars, the English work is excelled in size and quality, and competed with in price. We can add our own personal testimony to the fact that this great stride in manufacturing excellence has been made within a dozen years. Nor is France alone in her excellence: Prussia equally displays engineering triumphs. She produces "steel cannon, more powerful than any of our own, carrying larger shot, with heavier powder charge; large ingots of steel, of magnitude and quality unequalled by any nation; tyres of locomotive wheels, which, imported into England, supersede our own highest qualities of iron; and complicated members of machines forged by Krupp out of a single piece of steel, so as to be equivalent to eight or nine of the old pieces, formerly fastened imperfectly into one."

We cite the testimony of Mr. Scott Russell, thus clothed with the authority of the Council of the Institution of Civil Engineers, not so much for its novelty as for its point. In those important branches of the profession of civil engineers as to which the witness can speak with authority, England, he tells us, is behindhand, when compared with France, Germany, and Belgium. In the construction of railways and railway plant (themselves of English invention); in that of marine engines and ships of war; in that of artillery; in smelting, mining, locomotive building, and the great branches of commercial machinery; in the organisation of skilled labour; we are becoming yearly unable to compete with the pupils of the technical schools of the Continent. For other branches of that noble profession which, rightly studied and practised, has for its aim to give to man the mastery over the fury of the elements, and over the physical forces of nature, we have a yet more gloomy prospect. Mr. Scott Russell, in a sketch of the education which he proposes to be given to the civil engineers of England, omits some important departments of the subject; while, in the selection of others which he proposes to introduce there is evinced some want of acquaintance with the magnitude, character, and difficulty of certain great ranges of scientific and artistic study. Thus forestry, a branch of the duties of the civil engineer of the utmost moment in our colonial empire (to say nothing of home) is not referred to. Mining forms no part of the proposed *curriculum*, although the practice of that occupation underlies the whole of our mechanical prosperity, and gives employment to so many of our population. Agricultural engineering, in which, both in its civil and its mechanical branch, lies the great hope of our future national wealth, is unnoticed. On the other hand, the "Theory of Beauty and Ugliness" is named as one of eight divisions of ordinary technic education, while the attainment of any such theory can only be regarded as the result of the specially devoted lifetime of a man of the highest natural gifts. Again, "Political Economy" is named as a "practical application of pure science!" side by side with the far inferior, but not more "purely scientific" subject of "workshop economy." This is like making political history a department of zoology. Mr. Russell has perhaps done more to show the actual defects of our system by giving a sketch of what reformers think it ought to be, than even by comparing its results with those of the higher education of Continental Europe.

Such being the outcome of our present system of engineering education, it is with regret that we see such remarks published by a president of the Institution of Civil Engineers, as,—"In the practical branches we are admittedly superior" (p. 192). Such a statement, however true it might have been twenty years ago, can now tend only to mislead. The idea of balancing what is called a "practical" against a "theoretical" education, is one of those shifts by which the introduction of any system of sound training has often been most successfully resisted. Put in its true light it means,—"Rule of thumb for ever." No doubt can be entertained that a purely abstract education, uninformed by practical experience, can never make a good engineer, any more than it can make a good physician, surgeon, or soldier. The mere intellectual work of acquiring information is simplified and rendered more easy by the introduction of specimens and experiments; and in all matters of construction no education is worthy of the name that does not make the

* "The Education and Status of Civil Engineers in the United Kingdom and in Foreign Countries." Compiled from documents supplied to the Council of the Institution of Civil Engineers. London. 1870. Published by the Institution.

pupil, to some extent handy in each constructive process. But the practical experience thus attained is of tenfold or hundredfold value when the attention is prepared to grasp the facts by proper preliminary culture. To speak of "practical" as opposed to "theoretical" education is to put a part for the whole. It is like attempting to teach botany by sending a man to live in the country for a twelvemonth, bidding him observe all the plants that come within his reach, and then calling him into the lecture-room, and requiring him to give his notions of the relative value and range of the artificial and the natural systems.

Our own system of "practical" education for the engineer is thus described by Professor Fleeming Jenkyn, M. Inst. C.E., in an inaugural address delivered in the University of Edinburgh in November, 1868, cited in the work before us:—

"Young men, at the age of about eighteen, enter the office of a civil engineer. Usually few questions are asked as to previous training. . . . The ordinary pupil is a sort of nuisance in an office, only tolerated in consideration of the fee which accompanies him. . . . Most pupils are so ignorant of algebra that they are not only incapable of working out a result for themselves, but actually cannot apply the simple *formulæ* which are given in engineers' pocket-books. The calculation of the solid contents of a wall is often beyond their powers. Their arithmetic is very shaky, and a knowledge of physics, chemistry, geology, or the higher mathematics, is wonderfully rare. . . . Not even a pass examination is required, and the ignorance of some pupils, especially in mechanical workshops, must be experienced before it can be believed. . . . *No one teaches them anything*, but they have the opportunity of seeing how some actual work is done."

The above description is not our own. It is given to the world under the authority of the University of Edinburgh, backed by that of the Council of the Institution of Civil Engineers! Let us hope that part of the shadow may be set down to the desire of the lecturer to make a brilliant rhetorical display. The remainder of the inaugural discourse is hardly such as to lead us to regard it as altogether a serious effort. The Professor is of opinon that "certainly much less" theory than is given abroad is required by the engineer. He would keep our technical education on a confessedly low footing, and tickets the breadth of his own views by the recommendation to "abolish Euclid as pestiferous." Still, with whatever-sized grain of salt we may season the account, there is in it too much of truth. In times of full employment the engineer in high practice has no time to give to his pupils. We are not aware of any instance in which a system of education has been organised as part of the office routine. In times like the present the engineer, for the most part, has either no pupils at all, or no opportunity of giving them practical experience, and no heart to give them theoretic teaching. The result is that the two or three years spent under the articles of apprenticeship are often wasted, or worse than wasted. If, at the close of the articles, a young man is fortunate enough to get an appointment of sub-engineer, and conscientious enough to devote his best energies to the discharge of his duties, he may be considered as then commencing his education—commencing it without teacher, guide, or prescribed plan of study, and furnished only with an amount of available education that would not be enough to give him the remotest chance of admission to the *École Polytechnique*.

For the contrast afforded by the Continental systems of education we must refer to the volume itself and to previous papers in our own journal. The information the former contains comes from France, Belgium, Holland, Sweden, Russia, six States of North Germany, three States of South Germany, Roumania, Switzerland, Italy, and Spain. In the United States and Canada alone, out of Great Britain, it seems to be considered satisfactory that "any body is as free to assume the style and title of Civil or Mining Engineer as he is to take that of blacksmith, and it is still done commonly without any regard to school diplomas." On the Continent of Europe, indeed, there is no absolute prohibition, as a rule, against the practising of self-taught or untaught engineers. But such men must enter the field at such considerable disadvantages, as compared with those where skill is attested by Government diploma or official rank, that only in rare circumstances can they have much chance of success.

The natural division between the civil and the military branch of the profession of engineers may be said to be everywhere prevalent. The latter forms, together with the artillery, the scientific portion of all European armies. But the care of the State extends, in most educated countries, to the support of institutions for the training of civil engineers, and to the consequent recognition of the distinct and organised *status* of the pupils who pass through these establishments with credit. In France two distinct bodies of civil engineers,—the *Ingénieurs des Ponts et Chaussées*, and the *Ingénieurs des Mines*,—are in the service of the State. The *École Centrale* was founded, about 1830, by an association of *savans* to train engineers for private industry. Since 1860 this school has been transferred to the direction of the State. The *École des Mineurs de St. Étienne*, the *École des Arts et Métiers*, and the *École d'Alais*, are elementary and practical schools for the training of foremen and managers of works. The recognised civil engineer in France enters on the active discharge of the simpler duties of his profession after a careful and thorough education of some fourteen years' duration, seven or eight in a *Lycée*, three in the *École Polytechnique*, and three in the *École des Mines*, or the *École des Ponts et Chaussées*, at Paris. The practical advance made by both the civil and the mechanical works of France during the past quarter of a century is such as to give a complete answer to any questions that may be raised as to the value of the professional training supplied by the State.

In Belgium the *Athénées*, or Royal Schools instituted in the different provinces, invariably comprise a professional section, preparing the pupils to enter the *École du Génie Civil* at Ghent, the Military School at Brussels, or the School of Mines at Liége. Five different civil diplomas are granted by these schools; although the law does not forbid the title of engineer being assumed without a diploma. The same principle of careful provision for the educational training of a body of competent engineers adequate for the civil requirements of the country prevails, with minor modifications, throughout educated Europe.

With regard to the important question of the *status* of the civil engineer, either in this country or abroad, little is directly said in the volume before us. On the Continent, as a general rule, the civil engineer ranks with his military brother; holds an acknowledged position in society, a definite rank in his own profession; and on all public occasions, court ceremonies, and the like, has the *pas* over untitled civilians. In this country it must be admitted that the social position of an engineer depends on his personal qualifications, rather than on any *prestige* reflected by his calling. The history of the profession is fresh within the memory of many of us. Before the great stimulus which was given to our public works by the genius of the Stephensons and their fellow workers, civil engineering cannot be said to have existed in this country as a distinct profession. Men of practical sagacity, or of constructive or mechanical ability, such as Watt, Rennie, Telford, rose from time to time to fame by the sheer force of genius. The school, if school there were, of pre-railway engineering, was of a very modest and humble character. The immense impulse given to constructive works by the success of the Liverpool and Manchester Railway caused a sudden demand for civil engineers. Robert Stephenson then reaped the full benefit of the education which his father had practised an honourable parsimony in order to afford him. Isambard Kingdom Brunel brought to the aid of hereditary genius the unusual advantage of thorough scientific training, having been a pupil of the *École Polytechnique*. The early railway engineers who came at all near those two distinguished men in public esteem owed their rise, for the most part, either to fortunate combinations of circumstances, to experience, which, though limited, was the largest available, or to that practical sagacity in dealing with physical difficulties, or in inspiring confidence in those who consulted them, which is sometimes a safer acquisition than more brilliant gifts. These men had no tradition of learning, little *esprit de corps*, no idea of any duty incumbent on them to originate a Guild, or to found a Faculty, of Engineering. Those of their pupils who had their wits about them obtained rapid promotion, which might enable them to learn their business; those who had no such qualifications were yet able to find employment as surveyors (for the annual Parliamentary demand for plans), or as draughtsmen. A large body of men became rapidly congregated, with no organisation, no security for education, no definite aim but to do the work of the day,—to make as rapidly as possible the railways and subsidiary public works, for which the public found the money.

Together with these impromptu engineers grew up the great body of contractors,—men trained, for the most part, to the use of the pick and the shovel, but often gifted with an instinctive knowledge of prices, and a wonderful practical sagacity, to which the world owes not a little. They made, in some instances, large private fortunes. But no one who is acquainted with the actual state of our experience as to the cost of work in 1832, can doubt that the contract system saved, in the early railway operations, many millions to the shareholders.

With the slackening of work consequent on our unwise and improvident effort to complete our great lines of internal communication simultaneously, a change took place which we regard not only as a professional, but as a national disaster. Engineers who had become accustomed to competence, or to more than competence; contractors who had made, or had lost, or had seen others make, large sums of money; dependents of all kinds, down to the sturdy army of the sons of labour created by our public works, viewed with natural dismay the cessation of employment. Then came a sort of galvanic energy, impressed by these men on the public, the period of "contractors' lines," a second season of activity, based on no real national want. The result was ruin. Loss to the shareholders, who had run after promised dividends like sheep at a gap. Ruin to many of the large contractors, who had been tempted by fabulous paper profit to undertake responsibilities which they could only sustain for a time, and of which the public declined to relieve them, and starvation to a host of engineers. It was not under such circumstances that—human nature being what it is—the status of the profession was likely to be defined, or the broad and deep basis of a well-tested education to be laid as the foundation of its future prosperity.

We are not among those who believe that there is no future for the civil engineer in England. But we hold that it is only by equalling the thorough scientific education of the Royal Engineers in this country, and of the civil and military engineers of the Continent, that that future will be secured. Very much is now falling into the hands of the Royal Engineers (the most highly educated body of men amongst us) that would be more naturally, and, in our opinion, with more satisfaction to all parties, discharged by civil engineers equally well educated. For all dealing with manufacturers, contractors, hygienic bodies, agricultural improvers, and the like, a military education is in itself somewhat of a disqualification. The attempt recently made to depreciate the value of the professional service of the architect and the civil engineer, to throw the responsibility of civil works, or of private speculation, on officers of the Royal Regiment, and to "sprinkle in" decorations by the employment of any architect who will condescend to take the part of a painter or decorator, is, we feel certain, most pernicious. In the face of a body either of civil engineers or of civil architects educated and organised as they are on the Continent, such an attempt would not only have been futile, but it would never have been dreamed of. As things stand,—thoroughly wrong as we are convinced that it is,—it can hardly be said to be without excuse.

We shall rejoice if the example of the Council of the Institution of Civil Engineers in publishing this volume be followed by other associated bodies. Nothing would be of more value at the present moment than a good description of the educational establishments which are doing so much for German engineering. The schools at Creuzot, or those attached to the manufactory of Herr Krupp, and some others on the Continent, are institutions of the highest technical value and of the utmost national importance. If we are to remain a manufacturing people, we must equal or excel our neighbours in this essential element of science. A clear, precise, masterly report on the technical schools of Continental Europe is a desideratum of extreme importance for our industrial future.

Proposed Church for West Brompton.—A church of large size is about to be built in Radcliffe-square, West Brompton. The designs have been made by Messrs. George & Henry Godwin, architects, and will shortly be submitted to builders for tenders.

ARCHITECTS, BUILDERS, AND THE PUBLIC.

THE following observations were made by the President of the Royal Institute of the Architects of Ireland at the opening meeting on the 24th ult., and will be found interesting:—

A topic of peculiar interest to ourselves has occupied a good deal of attention lately; and the discussion of it has caused a good deal of criticism—of a more or less depreciatory character—to be directed to our profession, its claims, its charges, its position, and its organisation. I allude to the well-known case of Mr. Ayrton, Chief Commissioner of Works, and Mr. Barry, as architect to the Palace of Westminster. It is unnecessary to occupy your time with any comment on the manner in which this controversy has been conducted. It is worth while, however, to advert to some of the points involved in the case, to remove misapprehensions in the public mind, which have prevailed even in quarters where the habit of judicial caution would, one would have supposed, have caused at least a suspension and hesitation in pronouncing against the custom of an honourable and not unlearned profession which has prevailed throughout the whole extent of Great Britain and America, and had so prevailed within the memory of man. A custom of such men, and so prevalent, is not to be condemned and dismissed as absurd without weighing all the circumstances. The case of the architect has to my mind never been fully or properly stated. Very important elements of it have been left merely implied by one side, and have not been appreciated by the other. I take it that our case, our whole case, stated broadly but simply, is this:—"After affording the client the full use of the plans, we claim the ownership of them, that they are ours, and that we have a right to them, that this right is founded in fairness and common sense, and has been maintained *semper et ubique et ab omnibus*." This is at once a tradition and dogma of the profession; and the only modification of this right is the right of the employer to the use of the plans as far as required for the execution of the works designed, or for explaining details of construction after execution. However circumstances may vary or modify its application, this is the right which we architects claim, which we all claim, which our fathers in the profession claimed before us—we claim no more than they did, and no less; even as they charged at the rate of 5 per cent. for the invention and use of their designs, we charge the same for the same; even as they gave only the use of the plans showing and explaining the invention, so we give only the use in the same way and to the same extent. What is there unfair or monstrous in this? In what way are the public defrauded? We have the same grounds for claiming the proprietorship in our plans as we have for charging 5 per cent. Will any judge say to a jury that an architect is not entitled to charge 5 per cent. for his services? Will he not rather say, and be bound to say, "It has been proved that 5 per cent. is the usual and customary charge for the services of an architect, and if those services have been performed, you must measure the compensation to be paid for them by that scale." Now, here we have a sort of equation: substitute proprietorship of plans for the 5 per cent. charge, and the judge's charge would run,—"It has been proved that the proprietorship of the plans, according to the use and custom of the profession, remains with the architect, and you must find accordingly." The cases are perfectly parallel. It is not a question of feeling or fancy, or even reason; it is a simple case of barter and exchange, and therefore to be ruled by custom and usage. Only it happens that every one knows that an architect's usual charge is 5 per cent.; few have the opportunities of knowing exactly the limits and boundaries of what is contained and included in what the architect is bound by custom to give for the 5 per cent.

It is stated that a case has been submitted to the Attorney-General of England on behalf of the Crown, and that his opinion is adverse to the claim of the architects. This is of very little importance; counsel advise on the case put before them, and on that case only. Now, in every dispute there are at least two sides; and, before it can come on for trial, at least two counsel, more or less learned in the law, must advise each that the client who consults him has a good case, and yet one of them must have a bad one. It would spoil a good many actions if only both cases could be submitted to one counsel; many a busy barrister, in such a state of things, would be reduced to the state of Neal Malone, the pugnacious little tailor, "blue-moulded for want of a fight." There can be no doubt that the opinion of the English Attorney-General is deserving of every respect, but until we see the case on which it was formed and expressed, we shall be premature in assigning any weight to it; and the previous history of this transaction, in which so much passion and prejudice has been intruded, leads one to view any case that would probably be submitted to counsel as subject to great suspicion of one-sidedness and unfairness—a case rather inviting concurrence in a foregone conclusion, than fairly describing doubts and asking for a solution of them.

Incidental to this question there has been a good deal of reference, in anything but complimentary terms to our profession and those bodies—such as our Institute—in which we are associated. They have been called trade-unions, and have been described as organisations for the purpose of overcharging the public. The unfairness of these charges and insinuations must be pardoned for the temptingness of them. In the heat of debate the opportunity of delivering a knock-down blow affords an irresistible temptation; no man can pause and reflect on its unfairness. There are, however, differences between our trade-unions and those of Sheffield among the grinders, and those among our *collaborateurs*, the brick-makers of Manchester. We do not raise our rates of wages when trade is brisk, nor do we blow up, assault, or attack in any way, physically or morally, members of our profession who choose to work cheap. It is true we neither admire nor imitate such irregularities of practice; but we do tolerate them. Our trade-union peculiarities are therefore, so far as regards the rate of compensation for services, merely declaratory, and, as such, are as useful to the public as to ourselves,—both they and we have a common standard, easy of application, to appeal to, and by which we are bound. One moment's reflection will show any one that the public—the employers—are even more benefited by having a distinct, clearly-defined scale to appeal to, and by which to measure the value of services rendered, than we are. I will give you an instance. Not long ago a civil engineer made what were called, by a stretch of courtesy, plans of a building, for which he charged, and was paid, 70*l*. These were very rude and imperfect sketches, without specification, or such drawings of details as would have been necessary to enable an estimate of the cost to be made by measurement in the ordinary way. The building would have cost, if executed, about 600*l*. at the outside. Now, according to the rules of this our organisation for overcharging the public, had one of us furnished these plans (had you seen them you would recognise the wide stretch of imagination necessary to realise even in fancy the possibility of such a thing); but had they been supplied by a member of this trade-union, he would, according to its rules, have been entitled, when he had completed his work by supplying the additional drawings that were necessary and the specification, to a sum of 15*l*.! So much for our organisation for overcharging the public. I presume, however, that even our detractors will acknowledge that it is for the interest of the public that architects should be as accomplished as possible in all the arts and knowledge required in the practice of their art, and that it is not undesirable, in the same interest, that they should meet, and by the interchange of ideas and experience, mutually improve each other, and by establishing a healthy tone of public opinion among the members of the profession, keep up a standard of respectability among its professors and practitioners which can be maintained by no other means. We are not singular in having such an organisation,—every calling or occupation among us has its union of some sort or other; and, being founded on reason, usage, and custom, we shall take the liberty of maintaining it, in spite of ugly names and angry vituperation.

There is one branch of our professional practice which is in a most unsatisfactory state,—I allude to the measuring and surveying branch, which concerns itself about the preparing of bills of quantities from the plans and specifications, the measuring and valuing work executed, or the computing the value of works not executed. This is a very important matter, and one which is greatly in need of being regulated as to the scale of charges, according to the guiding principle of our organisation as a trade-union, for the protection of employers, and to a less, but still considerable extent, for the protection of contractors. It is very desirable, and I earnestly invite the attention of the Institute to it, that a scale of charges should be framed and published under the authority of the Institute, such as it is, by which a remuneration would be fixed that should be fairly proportional to the labour and time expended. I would advocate, not one uniform per-centage rate, but a rate varying with the quantity and quality of the builder's work done or to be done; so that each employer should be called on to pay in proportion to the value of the services rendered to him. At present there is, I know, a rough approximation to such a system of charging, but it is deficient in every respect; and in fact there is no rule, or, as I would prefer always to put it, there wants an authoritative declaration of the usage and custom of the profession. There are other defects in the present system, or rather want of it. The independent building surveyor is subject to very great temptations. In common with all the rest of the world, he is liable to err—he, perhaps, more than usually so, from the business being one of immense detail, and not admitting of any such mechanical means of insuring accuracy as the system of double entry in book-keeping. For instance, probably no two surveyors, measuring from the same plans and specification, and using the same scale of prices, would bring out the same result. In this liability to innocent and hardly-avoidable error, there is an irresistible temptation to protect the contractor, who only has the means of discovering omissions or shortcomings by taking out all the quantities full, as it is technically called, which, being interpreted, means making the employer pay a little more on all items, to guard against the chance of his paying less on some than he ought. Another temptation not without weight occurs in cases of competition; and it is my experience of such cases that the measurer, although paid, in the long run, by the employer (the public), is generally appointed by and, in the first instance, paid by the builder; and that his continuing to be employed depends largely on his skill and ability in swelling the builder's bill. In theory, he is a sort of arbitrator; in practice, he generally is attorney for plaintiff; and, while I would never dream of charging them with purposely increasing quantities or prices with reference to what the amount of their percentage at foot of the account will come to, I do maintain that there is an unwholesome influence exercised by their position at present, which is such that they will lose their clients if they fail to make out big bills. Now the remedy for this state of things appears to me, and I throw out the suggestion with great humility;—(I am peculiarly circumstanced, but perhaps that peculiarity may be of some advantage in considering matters such as these.) The remedy I would suggest is, that the architect should resume the functions which have by degrees, during the last generation, been gradually devolved on a separate class of practitioners—a distinct branch arisen within the profession. I would recommend that we should become again architects and *surveyors*; that we should ourselves, either personally or by deputy, in our own office, or by employing some other person, but in every form of the case that we should ourselves be the responsible surveyor or measurer. This is very much the custom in England, and is, I believe, all but universal in Scotland. In England, however, I believe there exists a vicious custom of collecting the charges for these services from the builder, who in turn charges the employer. This is a vicious custom which I hope will never be established here, and it is wholly unnecessary. Let the charge made for the work be a fair and reasonable one, in accordance with a scale published by the Royal Institute of the Architects of Ireland, as the fair, usual, and customary charge for such services rendered, and there should be no necessity for disguise about it. Let the charge be made openly and above board to the employer himself, and therefore to his knowledge: not as the English practice seems to be, surreptitiously, anonymously, in disguise, as it were, as if there were something to be ashamed of. Such a course is largely for the interest of the employer, and not antagonistic to the proper interests of the builder; and in this respect also, should the suggestion which I have ventured to throw out be acted upon, our trade-union will prove itself to be endowed with the highest of the Christian graces,—the charity

which does good to its natural enemy—the public.

The most prolific source of suits at law about buildings is the question of quantity and value. Whether work is done or not, is a matter of fact, and capable of ocular demonstration; whether it is done well or ill, is comparatively rare as a subject of dispute; but quantity and value are the commonest grounds of dispute, and if the ingenuity of the most perverse of human beings were puzzled out to devise the worst sort of tribunal before which to bring such a dispute, none could be devised worse than a British judge and jury. With a judge alone there exists the disqualification arising from technical ignorance, but which is often to a great extent overcome and neutralised by intelligence and good ordinary common sense; but multiply the judge's worst difficulties and disqualifications by twelve, and you have a state of things so monstrous that nothing but the vicious conservatism of mere lawyers has maintained it to the present day. Our common law and trial by jury are themselves on their trial; thinking men are recognising both to be relics of barbarous ages, suitable for a state of society and relations which existed 300 years ago, but which no longer does exist; and we may hope that ere long courts will be established on the principle of deciding cases according to the equity involved in them, and no longer in accordance with arbitrary rules and precedents which have long out-lived the theories on which they were originally based; and it is further to be hoped that arrangements may be made for constituting courts so as that the bench shall not be occupied by a judge sitting alone and unassisted, to whom the technical description of the material facts of the case, expressed of necessity in technical terms, is conveyed, or attempted to be conveyed, in a language as unintelligible as Chinese.

If I am not occupying your time too long, I should wish to say a few words about building contracts and competitions, and our intercourse as architects with builders. I am only saying what is within the knowledge of you all, that building contracts have become a very different sort of thing from what they used to be. They are charged both in form and complexion, and, generally speaking, for the worse. I can remember the time when the ancient style of building was not yet quite exploded, when for every work, at any rate of any importance, each trade formed a separate contract, frequently taken by different men; the person who did the bricklayer and mason's work was a different person from the contractor for the carpentry and joiner's work, who on his part never meddled with plumbing, plastering, painting, &c. In this distribution of the parts of the work among several contractors there certainly arose jealousies and bickering and recriminations frequently if things did not go quite smoothly; each trade was anxious to thrust the blame of delay or failure on to his neighbour's shoulders, and progress was necessarily slower; but there was a compensation in the system for even more serious inconveniences, for each contractor was master, in the strict technical craftsman sense of the word, of his own trade; he had a personal and thorough knowledge of it in all its branches; he had learned it in its first rudiments as an apprentice, and had worked his way to mastership in it. This familiarity begot a feeling of pride in good workmanship, and there was also a sort of rivalry arising from other craftsmen having to follow him in the building to go over and finish his work. Now, in our present system a man may become a builder who knows nothing whatever of the craft of building, and if he be prudent and careful in the selection of the person he employs, he may rise to eminence and opulence by it. It is a fact that few of our builders have really learned their business as a whole. They generally know one trade—that to which they were originally apprenticed—well, but of all the others have only acquired a very superficial knowledge. Now, to such men the value of work is estimated by what price can be got for it, not by the old scale of prices, based on the cost of materials, and workmanship, and a fair profit added thereto. In such hands workmanship must surely deteriorate. They have not in themselves the same standard of good work as their predecessors had; they are not as good judges of it—they cannot so thoroughly appreciate it; and consequently their chief standard is what will pass the architect's approval, as to quality, and what can I get it done for as to price — both which considerations tend inevitably to lower the quality of the work, and to raise a trial of skill between architect and contractor—the one trying in vain to get for his employer what the contract sets forth in such constant iteration,—"Thoroughly skilled labour and materials the best of their several kinds," and compelled in many cases to put up with, and give his certificate for, work which he knows well (and the builder knows too) is not of the quality that he bargained to get, but which is not so glaringly bad as to enable him to prove to the satisfaction of a judge and twelve jurymen that it is not what was contracted for. The builder's interest is only to make money by a job, and pass on to another; and the system of competitive tenders has tended to induce a sharpness of practice between architect and contractor which has gone a long way to overturn that feeling of mutual confidence founded on mutual respect which characterised the relation between them in former times, until a modern set of plans and specification is become a mere trial of skill and ingenuity between the parties. I wish I could even hope that such a state of things could be undone again. I wish we could look forward to a time when the architect would select his contractor from his known worth and intelligence, and pay him a fair price for good work actually done. But this is impossible. There is an amount of convenience to the employers in being able to look forward to the completion of their work at a certain fixed sum, that the system of contracts for a lump sum will always prevail—we shall never be able to get rid of it. We must, therefore, make the most of it by care in the preparation of our plans and specifications, by looking to the character of our builders, and by setting our faces against the acceptance of unduly low tenders. No man can be expected to do work at a loss, if he can avoid it; and if we are pressed with the usual argument that the tender should be accepted, and could be safely accepted if good security be given, it is our duty and our interest to press on the employer the consideration that he will inevitably lose more than the saving of cost in the lessened value of the work, and that a contract, if drawn up with all the ingenuity of man, is only of use with an honest contractor. A man who has nothing to lose will laugh at clauses engrossed on parchment; he is safe in his very impecuniosity. The character of the contracting parties, and the absence of any unfair advantage on either side, are the best and most satisfactory contracts.

WHAT IS ART?*

If it be true, as has been surmised by a great critic of human nature, that the same words do not convey precisely the same meaning to any two minds, surely of no word could this be predicated more indisputably than of that short but hardly worked monosyllable "art." The word is of late years in everybody's mouth; one can scarcely open a magazine without stumbling over an essay on art in some shape or other; but words, as Hobbes told us, are "the counters of wise men, and the money of fools;" and, assuming wisdom for a moment, it may not be quite useless to inquire what it is which this word really stands for with us; of what ideas, or class of ideas, is it the "counter"? To a good many who use it the term probably suggests indistinct images of picture galleries and sculpture ranged upon orderly pedestals; of an annual crush at the Academy rooms; or of Continental guide-books and ciceroni. To a selected few, who possess the golden key to the acquisition of a "taste" in art, it may rather seem to indicate a privileged lounge through the private studios of sundry painters, or a sale of "old masters" at Christie & Manson's, where the initiated may hold sweet converse in that peculiar shibboleth of conventional phraseology which Byron, referring to one branch of art, contemptuously stigmatised as

> "The paltry jargon of the marble mart
> Where pedantry gulls folly."

There are those to whom art furnishes a trade as regular and lucrative as other more creditable pursuits; whose occupation is to make merchandize of the brainwork of better men than themselves, and who know to a guinea the market value of each work; and there are those more hardworking and praiseworthy mortals, to whom "Art" stands as the lifelong endeavour to master the difficulties and problems of one or other form of artistic expression, laborious bit-by-bit, perfecting of the voice or the hand and eye in the self-assigned task of overcoming mechanical difficulties of execution, or of imitating, with arduous exactness, certain forms and aspects of external nature, but with little consideration as to what is the real end and good to be attained by all this conscientious expenditure of labour. And so one might go on enumerating, almost *ad infinitum*, the possible range of ideas which might be called up in various minds by the utterance of this one somewhat too familiar monosyllable. But is all this "art," after all? There are separate "arts," in a more technical sense—the art of singing, of portrait-painting, and so on,—but are all these collectively, or is any one of them that which we mean when we speak of "Art" in the highest and widest sense? Was it of such things that Goethe was thinking when he uttered the oracle that "He who has Art and Science (*Kunst und Wissenschaft*) wants not Religion"? Scarcely, one would think. What is it then, this unknown God to whom so many altars are inscribed, and whom divers ignorantly worship? Can our philosophers give us any assistance here?

Now it does so happen, rather curiously, that within a recent period, the two men who may be said to be the leaders of the most strongly opposed schools of thought among us, did on two very similar occasions give forth a kind of brief confession of faith as to what they considered art to be; both taking the great German artist and critic as their prompter, and both, though in sufficiently diverse fashion, coming to very much the same result. It may be suggestive to glance at this. In his rectorial address at Edinburgh, Carlyle, after alluding to the ideal school of culture described in "Wilhelm Meister," continued:—

> "Wilhelm left his own son there, expecting they would make him a master of arts, or something of that sort; and when he comes back for him, he sees a thundering cloud of dust coming over the plain, of which he could make nothing: it turned out to be a tempest of wild horses, managed by young lads who had a turn for hunting. His own son was among them, and he found that the breaking of colts was the thing he was most suited for. This was what Goethe calls art, which I shall not make clear to you by any definition unless it is clear already. I would not attempt to define it as music, painting, poetry, and so on; it is in quite a higher sense than the common one, and in which, I am afraid, most of our painters, poets, and music men would not pass muster."

Truly, one may fear not, with a few exceptions. This is rather ambiguous, however, and perhaps those who heard it at the time might have a reasonable doubt whether it was "clear already." Let us see whether Mill, in his address at St. Andrews University, has said anything to define the subject a little more clearly for average comprehensions. He tells us that,—

> "There is a true meaning in the saying of Goethe, though liable to be misunderstood and perverted, that the beautiful is greater than the good; for it includes the good, and adds something to it; it is the good made perfect, and fitted with all the collateral perfections which make it a finished and completed thing. Now this sense of perfection, which would make us demand from every creation of man the utmost which it ought to give, and render us intolerant of the smallest fault in ourselves or in anything we do, is one of the results of art cultivation. No other human productions come so near to perfection as works of pure art. In all other things we are, and may reasonably be, satisfied if the degree of excellence is as great as the object immediately in view seems to us to be worth; but in art, the perfection is itself the object. If I were to define art, I should be inclined to call it the endeavour after perfection of execution. If we meet with even a piece of mechanical work which bears the marks of being done in this spirit,—which is done as if the workman loved it, and tried to make it as good as possible, though something less good would have answered the purpose for which it was ostensibly made,—we say that he has worked like an artist. Art, when really cultivated, and not merely practised empirically, maintains, what it first gave the conception of, an ideal beauty, to be eternally aimed at, though surpassing what can be actually attained; and by this idea it trains us never to be completely satisfied with imperfection in what we ourselves do and are: *to idealise, as much as possible, every work we do, and, most of all, our own characters and lives.*"

In these noble concluding words, which might well form a text or motto for all the centres of education and culture in the land, Mill comes round to something very like the conclusion hinted at by Carlyle, viz., that "art," in its broadest sense, is a maintenance of the highest ideal of life, the striving after an ideal standard never to be fully comprehended, always beyond our reach, yet always to be aspired after as it rises ever higher and higher. But for this last sentence it might have been objected that his definition was somewhat too hard and material ("the endeavour after perfection of execution"), as Carlyle's, on the other hand, is certainly too vague and abstract, and makes too little account

* By Mr. H. H. Statham, Jun. From a paper read before the Liverpool Literary and Philosophical Society.

of those concrete forms of expression commonly known as the fine arts. The real relation of these latter to the mental kingdom of art, to the "ideal beauty" spoken of above, is much and strangely misunderstood, and is not, perhaps, duly indicated, even in the latter of our two quotations, fuller and more precise though it be than the former. Both philosophers seem to be afraid of committing themselves to giving too high a place to a class of pursuits which unquestionably are made the pretext for an infinity of cant and humbug, and which are often practised successfully (in the eyes of society) by persons of anything but high intellectual endowment or culture. But, in fact, those concrete forms of art, music, painting, sculpture, though too often—

> "Profaned by every charlatan,
> And soil'd by all ignoble use——"

are, in fact, the outward and visible signs of an inward spiritual grace, the media through which that indefinable and longed-for beauty is given for the time visible form and feature, the bridge which gives passage from the finite to the infinite. But it is the bane of art, and what gives ground for the half-contempt with which the calling of artist is regarded by many strong and earnest men among us, that the means are constantly mistaken for the end, the physical and material expression regarded, to the exclusion of the metaphysical beauty which underlies this; the mere execution of the craftsman becomes the object of attention, and in place of being the exponent of an ideal world, is rather made a screen to shut it out from us. Too often this is the case with the professed artist himself, who, being mainly occupied in labouring at and perfecting one special form of expression, is under a ten-fold temptation to make that his end, and, unless endowed with an exceptionally high imaginative faculty, almost to lose sight of the ideal object of the art which he practises. How this aim after mere technical skill appears to the artist of really poetical temperament we may learn from a passage in the desultory writings of that remarkable genius, William Blake, the painter and engraver, whose works are only just now beginning to receive something like recognition from a minority of his countrymen. "A man," says Blake, "sets himself down with colours and all the articles of painting; he puts a model before him, and he copies that so neatly as to make it a deception. Now, let any man of sense ask himself one question,—Is this art? Can it be worthy of admiration to anybody of understanding? . . . No man of sense ever supposes that copying from Nature is the art of painting; if the art is no more than this, it is no better than any other manual labour; anybody may do it." The last statement, of course, is an exaggeration; and, moreover, it must be said that there is a high degree, though not a high quality, of pleasure derivable from the contemplation of perfect executive power in any branch of art—from such fruit-painting as that of Lance, for instance, or from the performance by an accomplished singer of one of Rossini's brilliant pieces of vocal display. But it is no less certainly true that all the higher and more serious value which a work of art can have is in direct proportion to the thought which it contains, to the degree in which it feeds and stimulates the imagination. Finish of form in art is simply the necessary means (absolutely necessary, be it admitted) of setting forth the idea and preserving it for future generations. That this is comparatively little recognised, is partly due to the fact that so many persons interest themselves only in one form of art-expression. A man has a "taste," as it is called, for painting, or for poetry; or he is that most relentless of bores, a "musical man." But those who cultivate no perception but for one form of art-expression naturally come, by little and little, to lose sight of the ideal which underlies it, and dwell only on the material facts and technical skill displayed, about which they get up a disproportionate and even absurd enthusiasm. It is as applied to this class of amateurs that the word "connoisseur" (*quasi a non cognoscendo*) becomes so notable a misnomer, since they are precisely the persons who do *not* "know" or appreciate the genuine value and meaning of a work of art, but only its conventional or market value. It is when art is generalised; when the several forms in which beauty can be embodied for us are compared and found to be only various expressions of the same thing, that we learn to place the materialism of art in its due subordinate position, and to recognise in its various productions not the means to furnish a drawing-room decorously, or to prop up a society of music-makers, or furnish occasion for the rival display of mechanical sleight-of-hand; but rather the loved and joy-giving symbols of something perfect to be aspired to, channels of escape from the meannesses and littlenesses of every-day life into

> "Regions mild of calm and serene air."

Viewed in such a light, art is surely something which it is good to look into,—something which a society of civilised and educated people might reasonably give their serious attention to, in striving to read aright its deeper and more recondite meaning. That we, however, as a nation, are far enough from any such serious and thoughtful appreciation of art, will, it is to be feared, be but too apparent even on a very general survey. Take, for instance, the art of painting, and its reception and treatment by the public, so far as exhibition-rooms afford a standard for judgment. The fine new suite of rooms of the Royal Academy shows as a motto round the entrance saloon the musical lines of Spenser:—

> "The hearts of men that humbly here admire
> Fair-seeming shows, may lift themselves up higher,
> And learn to love, with zealous, humble duty,
> Th' eternal Fountain of that heavenly beauty."

The selection is a most happy one, and perhaps it would be difficult to find a passage more truly indicative of the highest scope of the painter's art. But looking at a large proportion of the works annually exhibited, there is surely some difficulty in tracing any connexion between their subjects and treatment and the sentiment in Spenser's lines. Among defects peculiar to English art, nothing is more remarkable than the apparent aimlessness of a large portion of its productions: one cannot guess why many of the pictures one sees should have been painted at all. This common deficiency in English art was noticed by Mrs. Browning, in her coarse but clever poem, "Aurora Leigh;" where, after speaking of the comparative narrowness of French sympathies, she observes that in France nevertheless,—

> "Art walks forward, and knows how to move;
> The artists also are idealists,
> Too absolute for nature, logical
> To austerity, in the application of
> The special theory; not a soul content
> To paint a crooked pollard or an ass
> As the English will, because they find it so,
> And like it *somehow*."

In other words, a French artist paints because he has something to paint; an English one too often because he has to paint something. But if we turn our attention rather to the public than to the artists, and notice what is most admired by those who crowd our exhibition-rooms, the result is far more unsatisfactory, far more decisively in negation of the sentiment embodied in the motto above referred to. What are the pictures which attract a crowd round them, which are the object of delighted comment, which paterfamilias is entreated "just to come and look at?" Are they those "fair-seeming shows" which bring high associations in their train, which open the gates for imagination to wander in fairer and ampler regions? No: almost invariably the pictures which are thus singled out for popularity are representations of some ordinary incident of commonplace, even vulgar, every-day life: a dapper young man asking the "governor's" consent, while his "intended" weeps on the shoulder of a fat mother,—a good little boy reading to a namby-pamby mamma,—a railway station,—a court stag-hunt, or some paltry incident of middle or lower class domestic life. Lord Byron, in a letter written from Italy, said with equal good taste and refinement, that he cared for no pictures but such as reminded him of what he had seen or might see; "as for all your saints and Madonnas, I spit upon and defy them." The British Philistine, with a good deal more excuse, perhaps, is in the same state of feeling as his lordship: he wishes for nothing in a picture but a reflection of himself, or of his own habits or prejudices. He is, to do him justice, too respectable to "spit," and too peaceable to "defy" anybody or anything; and upon all works of ideal art he gazes with a stolid indifference, more hopeless to deal with than the most violent positive dislike.

You may spend two or three consecutive days in the Academy rooms in the high tide of the season, and scarcely hear one remark from any one of the crowd who move with difficulty through the rooms indicating the slightest idea that a picture, if it is worth anything, is a thing worth serious study; that the artist's thought will not be laid hold of but by the spectator who brings thought of his own to meet it; or that the whole thing is anything but a more or less agreeable lounge, where it is the fashion to go, and where one can meet one's friends: indeed, but for this last motive, might it not be said, as it was of the concourse at Ephesus, that "the most part knew not wherefore they were come together?" It is not surprising that one or two of our most thoughtful artists have altogether declined competition for public favour in such an arena. And it can hardly be said that this nonchalant attitude towards the art of painting as publicly exhibited is compensated for by any very large amount of intelligent appreciation thereof in private life. It is true that the "patronage" of art (as it is termed), the ambition to possess a fine collection of paintings, is no longer considered as the exclusive privilege of the nobility; that this ambition is largely indulged by a class who a generation or two back would have scouted such an outlay as a frivolous waste of money. And there can be no question that among the wealthier mercantile men of England are to be found those who have both a genuine enthusiasm for, and a very competent critical judgment on, works of art of a high class; and that a perception of the value and dignity of art is slowly permeating social strata which were once considered to be necessarily innocent of any such predilections. But is there not, in the mean time, a vast amount also of mere ostentatious display of the power of the purse in such matters, a sort of feeling that it is "the thing" to have good pictures, a display of what is called a "valuable painting" exhibited just as another man exhibits particular old port, as something he was lucky in getting, and which every one cannot get? And is this a worthy way of looking at a great branch of imaginative art? And still meaner is that appetite for speculation in works of art which is too frequently met with, which leads a man to look out for pictures that are likely to rise in the market, and to boast (as we must all have heard people do) that he can get twice as much for that picture, any day, as he gave for it. It is to be feared that this mercenary view of art is only too much encouraged by the grasping and money-making propensities of some of the artists of most popular name among us. It was remarked by an eminent French critic, the late M. d'Henriet, whose admirable essays on art were familiar to readers of the *Revue des deux Mondes*, that many of the English artists, though they devoted a great deal of time to the study of the greatest examples both of ancient art and foreign contemporary styles, seemed to carry none of the fruits of it into their practice; "they make experiments," he says, "with a picture-dealer, and turn out rapidly the style of pictures which will be popular in the market." It is known that this is precisely the case with regard to some of the most popular English painters; and the result is what might be anticipated from such a system; the prices are forced up to a conventional standard by the avarice of dealers, and the painter, finding that he can get his own price for anything with his name to it, is content to turn out pictures with no recommendation except the power of manipulation which long practice has given him, and to repeat himself to any extent, until one is absolutely weary of the sight of his mannerisms. Hundreds of pictures of this kind are bought, at prices which are quite ridiculous, by persons who positively would not give a shilling for the same work without the artist's name on it. And this sort of folly and these forced prices foster the idea that art is only a luxury for the few; a notion which seems at least to be practically acted upon. In how many of the drawing-rooms of persons of average means do we find on looking at the walls any indication of the owner's tone of mind, anything to show that the pictures or prints hung there are introduced from any other motive than merely to fill up the wall and give the room a furnished look? Prints or photographs of some well-known popular picture, or some of those great coarse commonplace engravings which "Art-unions" dispense to their subscribers, mostly form the staple, with perhaps some starved little statuette of a Venus or a dancing-girl; and rarely indeed is there anything which suggests a new and original idea. Yet something far better than this is attainable, were it wished for, without pre-supposing extravagant outlay. I have certainly known rooms, and those of no wealthy owners, which it was a

pleasure to go into, not because their walls were decorated with expensive purchases, the work of well-known or famous artists, but because all that was hung there had a meaning and significance, and whether it were print, or photograph, or water-colour, showed unmistakably that it had found place there not as a mere piece of furniture, not because it filled up the wall or went well with the carpet or curtains, but because it was something that its owner loved, that answered to some phase of his own mind, and furnished the starting-point for some pleasant train of thought and association. Thus it is that genuine art, even in its simpler forms of expression, can impart a character and grace of its own to a dwelling, which no mere tasteless or ostentatious expenditure can emulate.

* * * *

It has been said by Bacon, in one of those weighty concentrated sentences of his, that "In the youth of a state arms do flourish; in the middle age of a state, learning; and then both of them together for a time; in the decline of a state, mechanical arts and merchandise." Does not this last ominous sentence seem to fall upon the ear like the knell of the real greatness of our country? That such an idea is present with some of the most clear-sighted and thoughtful minds among us, is evident enough from what we sometimes read,—notably so in a passage from one of Matthew Arnold's late poems, entitled, "Heine's Grave," where, apostrophising the spirit of the departed German satirist, he says,—

> "I chide with thee not, that thy sharp
> Upbraidings often assail'd
> England, my country; for we,
> Fearful and sad, for her sons,
> Long since, deep in our hearts
> Echo the blame of her foes;
> We, too, sigh that she flags;
> We, too, say that she now,
> Scarce comprehending the voice
> Of her greatest golden-mouth'd sons
> Of a former age any more
> Stupidly travels her round
> Of mechanic business, and lets
> Slow die out of her life
> Glory, and genius, and joy."

It is to be feared that the class which is becoming in many respects the dominant one amongst us has little sympathy with anything that is great or elevated, little aspiration beyond its own restricted and mercenary ideal of life. If we are to rise above this, to escape from this "slough of Despond," it must be, as it seems to me, by informing the minds of the masses of society with some appreciation of a standard above themselves, with something like a love and desire for what is beautiful for its own sake, giving, as Wordsworth has said, "Nobler thoughts and nobler cares" than those of mere existence. We have plenty of schemes for the regeneration of society,—schemes theological, political, social, each claiming to be a universal panacea for all shortcomings of modern life: we have no lack of philanthropists,—some of them with more zeal than knowledge. But man shall not live by bread alone; nor will charitable schemes, almshouses, extension of suffrage, suffice to fill the void, and to convert mere blank existence into anything which can in a true sense be called *life*. To do this is the province of art, taking the term in the wide sense, as signifying the development of the beautiful side of life,—the exhibition and setting forth through whatever form or language of ideal beauty. Progress in this direction must necessarily be gradual, for there are many prejudices to overcome before the ordinary Briton will consent to give anything like serious attention to art at all. Much of the highest art, for instance, deals with the most passionate feelings of human nature exhibited in all their force; but there is nothing from which your typical middle-class Englishman recoils so much as the display of naked passion; it is something which puzzles, we might almost say, frightens him. There is much education of mind to go through, too, before the highest language of art, the highest forms and types through which the beautiful can be made manifest, can even be understood at all by the majority; and it is towards altering this state of things that our national education should be more specially directed than it is.

Lead in Thornbury.—In a deep cutting near Gravesend, on the new line of railway between Yate and Thornbury, the men have come on a load of rich lead ore. Some years ago shafts were sunk near here, but the work was abandoned. The present discovery will most likely give a new impetus to the scheme.

"COLESHILL BUILDINGS," PIMLICO.

The pile of dwellings in Ebury-street, Pimlico, opened in November by the Duke of Cambridge, as we briefly mentioned in our last, has been erected by "The Improved Industrial Dwellings Company," better known as Sir Sydney Waterlow's Company, which was founded in 1863 for the purpose of affording to the working-classes healthful and comfortable homes at fair rents, and getting in return a fair per-centage on the money expended. To obtain a reasonable commercial profit on the capital is, in the opinion of the directors, "an absolute necessity, in order to secure the progress of the work of reconstruction which the company has undertaken, and the first consideration is, therefore, to provide dwellings thoroughly adapted to the requirements of those for whom they are intended, and of so attractive a form and appearance as to obviate the objection often expressed to 'model lodging-houses,' as they are sometimes rather ostentatiously called." They properly laid down as a rule that every tenant must have complete and *exclusive* use of all the essential accessories to a home, such as water supply, sink, copper, dust-shoot, coal-place, and water-closet. In some cases, economy of space and cost of building have been sought to be obtained by arrangements whereby two or more tenants have had the use of those requisites in common; but the divided use of such adjuncts to the dwelling very much diminishes its value, and the few cases attempted by the company proved comparative failures. There can be no doubt as to the necessity of providing these appendages to every dwelling.

At the present time the expenditure and commitals of the company on capital account amount to about 200,000*l*. Of this sum, 125,000*l*. have been subscribed by the shareholders, 52,000*l*. have been borrowed from the Public Works Loan Commissioners, under "The Labouring Classes Dwelling-houses Act, 1866," and negotiations have been entered into with the commissioners for an advance of the balance. We give a list of the dwellings which have been erected by the company:—

	Tenements.				
	Three Rooms.	Two Rooms.	One Room.	Shops.	Total.
Cobden-buildings, King's Cross-road	8	10	...	2	20
Nelson-buildings, Bridge-street, Greenwich	20	20	...	...	40
Tower-buildings, Brew-house-lane, High-street, Wapping	30	30	...	...	60
Stanley-buildings, Old St. Pancras-road, King's Cross	51	50	...	3	104
Palmerston-buildings, City Garden-row, City-road	36	36	...	...	72
Cromwell-buildings, Red Cross-street, Southwark	10	12	...	2	24
Derby-buildings, Britannia-street, and Wicklow-street, King's Cross-road	40	118	...	10	168
Gladstone-buildings, Willow-street, Finsbury	84	84	...	...	168
Waterloo-buildings, Bethnal-green Estate	21	48	3	...	72
Ebury-buildings, Ebury-square	40	25	...	4	69
Coleshill-buildings, Ebury street and Queen-street	50	60	...	10	120
Buildings in course of erection at Bethnal-green	...	130	...	...	130
Total completed and in course of erection	390	623	3	31	1047

The company also purchased at Bethnal-green an estate of about nine acres, which was chiefly covered with small dilapidated houses. Many of these have been pulled down and replaced by improved dwellings, and the remainder will ultimately share the same fate.

The net return upon the capital invested, after carrying the proper contributions to the leasehold redemptions, and other reserve funds, has been sufficient to pay a uniform dividend of 5 per cent., and to carry forward balances which at the 30th of June last had accumulated to 2,603*l*.

Let us look now to Coleshill Buildings, Ebury-street. Here there are five blocks of buildings, each six stories in height from the basement. The general plan of a block may be described as a parallelogram, having a frontage of 56 ft., divided into four sections by a party wall in the centre, and a passage in the middle of each wing. The two centre sections are set back about 3 ft. from the front line, for the purpose of giving space for a balcony of that width on each of the upper floors. Each section comprises one suite of rooms, to which access is obtained from the passages leading direct from the balcony. The balconies are reached by a fire-proof staircase, which is continued to, and gives access to, the roof. The larger dwellings, consisting of three rooms and a small kitchen, occupy the end sections of the building. The living-room in each dwelling is provided with a range having an oven and boiler. Leading out of the living-room is the kitchen or scullery, which contains in every case water-cistern, sink, a small fire-place, washing-copper, dust-shoot, and water-closet. The front room is a parlour having two windows.

The centre sections, comprising the smaller dwellings, consist each of two rooms and a kitchen. The plan is the same on each side of the party walls, and every floor or flat is a repetition of the other. In the ceilings of all the rooms a ventilator is placed, which communicates with air-shafts running through the centres of the blocks. The lower panes of the windows are filled in with ornamental ground glass, so that no window-blinds are necessary. The windows are constructed so that the two lower panes are not made to open, and the danger of children falling out, as well as the disadvantages of the ordinary window sashes, are avoided. All the rooms are 8 ft. 3 in. in height. Drainage is effected by means of stoneware pipes passing from the top of the buildings, down the corners of the wash-houses, into a syphon trap, with an upcast ventilating pipe, and thence direct to the common sewer. The dust-shaft carries the dust to covered receptacles at the base of the building, and each shoot is provided with an iron cover, so as to prevent the return of dust and effluvia. The dust-shafts are also continued to the top of the building, and will act as ventilators to the dust-bins. All the rooms are plastered and papered, the woodwork is grained and varnished, and the kitchens are plastered and coloured. Every tenant has his apartments completely to himself, and nothing is used in common except the drying and recreation ground.

An arrangement worth noticing is, that provision is made for a constant supply of water to each of the houses. By a clause in a recent Act of Parliament, the water companies are bound to provide water by meter to those who demand it. It occurred to the company that, by the erection of capacious tanks at the top of each block, they might obtain the means of a constant supply of water to each family at a cheap rate, if they could secure themselves against the inmates wasting it. For this purpose they have fitted the water-pipe in each house with a spring of an ingenious construction, which, when the tap is turned on, allows a moderate supply of water to be drawn, and then stops of its own accord. This effectually prevents the negligent waste of water, and nothing but downright malice can cause it to run to waste. The effect of this will be, that each family in all the tenements will have a constant supply of water in his home every day in the week. This arrangement was made by Messrs. J. Tylor & Sons, of Newgate-market, who have also perfected a stand-pipe, which has an ingenious contrivance of internal valves, so that, even if any one should carelessly leave the tap turned, the valve would shut after a short time, and the water would cease to run. The apparatus well deserves attention, and will enable water companies to do more for some of our courts and alleys than they have hitherto been led to effect.

We will mention that the whole of the stoves, cooking-ranges, and cast-iron mantels, numbering in all more than a thousand, were supplied by Messrs. Yates, Haywood, & Co. These have been made under the immediate direction of the architects, and, for simplicity and cheapness of construction, are worth attention. The ranges, with oven and boiler, cost 22*s*. 6*d*. a piece; the iron mantel-pieces, with trusses, 14*s*.; and the scullery-stoves, 6*s*. 6*d*. a piece.

The architects were Messrs. Beck & Lee; the builders, Messrs. J. Perry & Co. The "Ebury Buildings," close by, were erected by Messrs. M. Allen & Son. The cost of the Coleshill Buildings is put down by the architects at 51*l*. a room.

One of the chief features in the construction of the dwellings, claimed to be peculiar, is the use of the patent stone manufactured by Messrs. Allen & Son, who built the company's first houses. This material is used for lintels, stairs, window dressings and sills, slabs, and so on;

and it is estimated that by its use a saving of about 20 per cent., as compared with other materials, is effected. In the first-built houses it was used for chimney-pieces, amongst other things; but its employment in this position is discontinued. The stairs at Palmerston-buildings, four or five years old, appear much worn,—the traffic being considerable. The material, we are told, is a concrete of gas breeze and Portland cement, in the proportion of five parts of the breeze to one of cement. A little pure cement, liquid, is first put into the mould, and gives a face to the work that requires no further manipulation.

In speaking of the buildings of a company so well intentioned as this we are unwilling to find fault, but we have an objection, and are bound to state it. We are forced to complain of *the want of bedrooms*. For a family, the dwellings which have but one chamber are incompatible with ideas of propriety and decency, and the same objection applies to the whole unless the intention of reserving a parlour or bettermost sitting-room be abandoned in favour of providing an additional chamber. We commend this point with great seriousness to the consideration of the directors.

The rent charged, if we understand rightly, is 5s. 9d. a week for the dwelling with one living room and one chamber, and 7s. 6d. a week for that with parlour additional.

The completion of these buildings will close the operations of the company, so far as the employment of its present capital is concerned; but they are quite ready, it seems, if more capital be subscribed, to go on again.

BRIDPORT, DORSETSHIRE.

SANITARY INQUIRY.

FOR ten years past the sanitary condition of Bridport has been the subject of grave and anxious discussion. An inquiry has been often asked for and demanded; but things have gone on from bad to worse. Matters, however, have culminated at last, the Home Secretary having appointed a commissioner, Mr. Arnold Taylor, to institute an inquiry into the state of the town. The inquiry was to commence, in the Town-hall, on Wednesday, the 30th ult. Had the few mistaken obstructives who for several years opposed all local improvements ceased to pursue their mischievous and fatal policy, the town would have been spared a compulsory measure. No doubt the result of the inquiry will show what we have over and over again stated in these pages;—hundreds hurried to premature graves; hundreds more suffering a living death, the consequence of bad sewerage, defective water supply, unremoved filth, badly-constructed and badly-ventilated dwellings, and general neglect, public and domestic.

SANITARY SHERBORNE.

THEY have peculiar ways of bottling-in smells, and "bottling up" surveyors' and medical officers' nostrils that are too sensitive, in Dorsetshire. The local surveyor in Sherborne, like a sensible officer, reported the existence of bad roadside gutters, drains, and so on, and the medical officer pointed out the bad places in the town where want of sanitary precautions was likely to result in an epidemic, fever and other symptoms having shown themselves. The chairman of the Board mustered some of his friends, and proceeded to visit the places pointed out as dangerous. The result was that the chairman and his accompanying friends declared "that they were really surprised to find the places pointed out so clean, tidy, and free from smells." We have no doubt that several other people would be equally surprised to hear this information. At the "full moon," it appears, the lamps are not lighted in economical Sherborne, nor even on dark nights when they are absolutely necessary. Does this arise, we wonder, from the fear of having a light thrown on such a dark subject as the black spots in the town? The surveyor was ordered to see to the gas-lamps, the road repairs, and the butcher nuisances; but the medical officer was ordered to be reprimanded and to be more careful in future of speaking or even alluding to foul smells, as it was likely to injure the town. This is certainly a novel method of carrying out sanitary improvements. What hope can there be of public life and safety if sanitary and medical officers are snubbed for being active in doing their duty, and pointing out a danger? If even the possibility of danger existed, do we not all know and agree that "prevention is better than cure?" It is likely that if we are called upon again to notice the matter, we shall supply the local authorities of Sherborne with facts from personal investigation that they should not ignore. Sherborne no more than Glastonbury is in a position to challenge inspection at this moment in respect of its lanes, roads, sewers, and closets. The local Board, chairman, and others, ought, therefore, to set about doing what is necessary for the health of the town, instead of denying patent evils, and snubbing their officers for performing the most important duties of their office.

WORKS DONE AT THE CENTRAL PARK, NEW YORK.

THE thirteenth annual report of the Board of Commissioners of the Central Park, at New York, for the year ending December 31st, 1869, has been issued in a printed form. The report is illustrated by numerous photographs and engravings of various subjects of interest in the park, such as statues and buildings, walks, cascade, and other views, animals, &c. We condense a little what relates to works done and proposed, and other transactions, in course of the year reported on.

The forces of the park have been generally engaged in the development on the grounds of plans heretofore adopted, and in maturing the plans for future operations. The Belvedere at the high ground of a central portion of the park is advanced so that the form of the tower at its south-easterly angle, and the open shelter at its south-west corner, are well defined and readily observable. This structure is designed to afford a prominent place of look-out over the whole extent of the park. The House, situated just north of the play-ground, is complete, and is much used by the boys, for whose convenience it was erected. The Children's Cottage is complete, and is also very much used. The Dairy, a rural structure of stone, is well forwarded. It is arranged for the convenient serving of milk and similar refreshments. The ceiling of the terrace has been laid with encaustic tile of varied design, and the decoration of the ornamental ribs of iron has been finished. All that remains to complete this ceiling is the introduction of the glass panel that is to admit the light upon the statues designed to occupy the central space immediately under it. The laying-out, fertilising, and planting of the maze or labyrinth, on the east of the old reservoir, is completed. This comprises within its inclosure 3,700 lineal feet of gravel walk, and 2,250 trees, as borders or screens to the walk, and is intended to render an attempt to reach its central point or to find a place of exit somewhat amusingly intricate and difficult. A fountain has been arranged at the Harlem Lake, by which a high jet of water is played whenever the supply in the reservoir is such as to admit of its use. A large stone, 17 ft. square, of polished Westerley granite, for the basin of the terrace fountain, has been contracted for. The bronze figures for this fountain are now in course of casting at Munich. The foundation-course for the horse drinking-fountain, at the circle, is set, and a large portion of the ornamental stonework is on the ground. A movable house has been nearly completed, for a cover to prevent damage to the music pavilion by the storms and snows of winter. For the purpose of compacting the bed of new roads, and also the surface of these roads, the Board has imported a steam road-roller, weighing about 15 tons. Invitations were sent to prominent mechanics and others interested in this class of machinery, to attend a trial of its propelling and compressing capacity. It was readily propelled from 110th-street, up the Great-hill, on a grade of 4·61 ft. in 100, and returned down the hill without difficulty or apparent stress on the machinery. The roller has been for some months used on the drive and circle in compacting the earth and surface road-metal. Professor B. Waterhouse Hawkins has been engaged in advancing the group of fossil animals more fully alluded to in the last annual report. A very wide interest, both in this country and in Europe, has been excited among scientific men by this interesting and novel undertaking. The great group of ancient animals formerly living, during the secondary geological epoch, on the continent of America, now being modelled and restored to the natural size and appearance of the animal as in life, by Mr. Hawkins, for the Central Park, consists of the gigantic hadrosaurus, of the exact dimensions (one 26 ft., the other 39 ft. long), as proved by the fossils described by Dr. Joseph Leidy in the "Smithsonian Contributions to Knowledge, No. 192;" also models of Laelap's *Aquilunguis* fossils, described by Cope, together with the aquatic *Elasmosaurus* and *Mosasaurus*. The second division of the group will illustrate the post-tertiary period, and represents the mastodon, the mammoth, megatherium, megalonyx, glyptodon, &c., thus uniting the early periods of animal life with the earliest evidence of man's existence, and so constituting a complete visual history of the American continent from the dawn of creation to the present time. The excavations for the structure for this department of the museum are now going on. The Board has been exceedingly desirous to proceed with the Zoological Gardens. The chief occasion of delay is the want of a proper outlet for the drainage of the ground and the regulation of the streets and avenues about it. A sewer has been commenced, which will in part accomplish this desideratum; but it will probably be at least a year before it is fully completed. The avenues and streets that surround these grounds are in such a state as to render them almost impossible of approach, and extensive excavation and filling is now going on in the vicinity. With these difficulties to contend with, over which the commissioners of the park have no control, they have done as much work in the last year as seemed practicable. In the habitations for the animals of the gardens, every arrangement that will conduce to their healthfulness and to the facility and convenience of observing them will be provided. Some progress has also been made in the preparation of designs and models for the houses for tropical carnivora. The plans of the proposed astronomical observatory have been much discussed, and extensive inquiry and examination has been made into the designs adopted for similar institutions.

Experiments were being made with Cooper's patent road-watering process, the commissioners having got a few tons of the deliquescent salts from England for trial.

The rate of tax for the year 1869 is 2·27 yielding, on the increased valuation above stated an increased tax of 2,810,150·54 dollars.

The total expenditure for construction, from May 1, 1857, to January 1, 1870, is		$5,775,387 14
The cost of the land of the park to the city is		5,028,844 10
Total cost of park to the city up to this time		$10,804,231 24
Total increased tax in three wards...		$2,810,150 54
The annual interest on the cost of the land and improvement of the park up this time, at 6 per cent. ...	$648,253 87	
Deduct 1 per cent. on 399,300 dols. of the above stock, issued at 5 per cent.....	3,993 00	652,246 87
Excess of increased tax in three wards over interest on cost of land and improvements		$2,157,903 67

A report of works outside the park follows the main report, and there is a voluminous appendix, with relative tables, diagrams, and plans.

STONEWORKING MACHINERY.

WE have examined with much satisfaction the working of some machines for sawing and moulding stone set up in Battersea, by a company which has purchased the patented inventions of Mr. G. Hunter and Sir William Fothergill-Cooke. The machine in question consists of a bed made to travel longitudinally, with a shaft mounted over it for receiving the revolving cutting or moulding head. So far, the machinery resembles that used for sawing; the head, however, instead of being a plain disc, with cutters, is shaped to the profile of the required moulding, and has the cutters fixed in it according to that outline. The rough block being fixed on the bed, which is made to advance while the head revolves, the upper face of the stone is cut very nearly to the shape of the desired moulding; the edges, however, are rather blunt, and the surface shows the tool-marks. When this operation has been performed, a scraping tool, formed exactly to the moulding, is fixed over the block; and, the block being made to traverse several times under this scraper, has its face finished true and smooth, with sharp, clean edges, and the perfect profile required. We saw some

strings and moulded steps well worked in a remarkably short time. The cutters being built up, as it were, can be made to give any required outline, and their form is such that they work a considerable time without needing grinding. A large amount of work for St. Thomas's Hospital has been done by one of these machines. Great saving of money and time is effected, and we should think the machinery can scarcely fail to come extensively into use.

Machinery for tunnelling, quarrying, and sawing stone is worked by the same company. Captain Palmer is the provisional manager, and Mr. John Imray the engineer.

ST. ANDREW'S, WELLS-STREET.

St. George's Hall, Langham-place, was the scene of a very interesting gathering on Wednesday evening last, — a parochial tea-party, which included the children of the boys', girls', and infants' day-schools; the children of the Sunday and night schools for boys and girls; the members of the Young Women's Friendly Society, and of the Young Men's Confraternity; the aged pensioners and communicants of the Church; and the women of the Parochial Mission, with their husbands. There were thus in the body of the hall about 700 persons, while the galleries were filled with inhabitants of the parish, who paid each a shilling to be lookers-on.

Mr. Herbert Barnard, presiding, made a happy little speech; and then the school-prizes were presented to the winners: Mr. Hughes, M.P., speaking afterwards. Miss Robertine Henderson and other volunteers sang some songs agreeably; and "Blue Beard" was brought from over the way, thanks to Professor Pepper, for the special delectation of the children. Chief praise is due to the vicar, the Rev. Benjamin Webb, for the success which has attended these gatherings of all classes of his parishioners. They constitute a parish "union" of a more agreeable kind than usual. New schools of considerable extent have just now been completed under the direction of Mr. G. E. Street, and the reredos in the church, designed by the same architect, and cleverly executed by Mr. Redfern, is fast growing to completion. The whole, with its doubled tracery and involved groups in very high relief, has a mixed Spanish and German aspect, which is novel in London.

GLASGOW UNIVERSITY.

The old pile in High-street and adjacent is in course of demolition, and the new buildings on Gilmore Hill, erected from the designs of Professor G. G. Scott, R.A., have been formally opened. We give a view of them, and plan of the ground floor.

The University of Glasgow was originally founded by a Bull issued by Pope Nicholas V., and dated January 7th, 1450-1, exactly forty years later than its only senior, the University of St. Andrews. It was established under the name then given to such institutions, viz, *Studium Generale*, which included theology, canon and civil law, and the arts. It owed its existence chiefly to the exertions of Bishop Turnbull, who in right of his office was appointed under the original foundation chancellor and rector of the University. From the first it formed an incorporation, including the chancellor and rector, the various masters and doctors in the faculties of theology, canon law, and the arts, and the incorporated students in these faculties; and it received the power of conferring degrees upon those who had pursued their studies in the manner prescribed by the statutes.

The University, though then destitute of endowments, and dependent solely on the contributions of the students and of persons interested in the promotion of learning, soon attained considerable success, so that, within four years after the original foundation, the business of instruction was proceeding with zeal and efficiency in a building situated not far from the cathedral, in the street now called the Rottenrow, and adjacent to the chapter-house of the Dominican Friars. This building, called the Pædagogium, appears to have been leased to the University by the bishop upon payment of a rent; and, along with the halls for delivering lectures or carrying on instruction, a house was provided for the residence of the students.

As early as 1460, James, first Lord Hamilton, gifted to the Faculty of Arts a site in the High-street, for its operations, and steps were taken for erecting or adapting buildings in the locality which has been ever since occupied by the college.

To this place, then, about the year 1465, the teaching and residence of the members of the University were transferred in whole or in part; and the name of Pædagogium, or college, was applied to the new buildings.

Thus, with various success, the business of the University, and of the faculty of arts within it, was carried on until the time of the Reformation, when, along with other institutions of Roman Catholic origin, the University was thrown into confusion by the loss of the support which it had previously derived from the Church.

In 1574 renewed animation was given to the academic teaching by the advent of the celebrated Andrew Melville; and such was the success of the University at this time that the account of Melville's nephew, confirmed from other sources, is not to be looked upon as exaggerated, when he says that "there was na place in Europe comparable to Glasgow for guid letters during these yeirs for a plentifull and guid chepe mercat of all kinds of languages, artes, and sciences."

From the time of the first acquisition of the tenement in the High-street we find in the records frequent mention of the application of all the money belonging to the Faculty of Arts to the erection and repair of buildings; but the funds must have been of the most scanty amount, and the work must have proceeded very tardily; for in 1563 they were still incomplete, when the confusion attendant upon the Reformation disturbed the projects and workings of the College and deprived it of all its resources.

The buildings in the High-street and adjacent ground appear to have been erected at various times,—a small portion of them only dating earlier than the year 1632, when the restoration of the oldest University buildings began.

They consisted of four courts or quadrangles, of which, however, two only form part of the original structure of the seventeenth century, viz., the outer court fronting the High-street, and the second or inner court, communicating with the first by an archway below the tower or steeple. It is but fair to mention that the Glasgow University is an institution whose benefits are not confined to the city or neighbouring districts. Its students, upwards of 1,200 in number at present, and likely to be largely increased, are composed of natives of every county in Scotland without a single exception, and include also in considerable numbers Englishmen, Irishmen, and Foreigners—all of whom receive a first-class university education at a very moderate expense.

It has had remarkable teachers. Speaking of the last 100 years, Mr. Cosmo Innes says,—"No other school of learning, within so short a period, can boast of an array of teachers like Cullen and Black in chemistry and medicine; Hutchison, Reid, Adam Smith, in mental philosophy; Moore, Young, and Sandford, in Greek literature; John Millar and Jardine, in what may be called the art of education." Nor is it unimportant to remember that it was in Glasgow University that Adam Smith delivered those lectures on political economy which formed the basis of his "Wealth of Nations."

The necessity for removal had long been felt by those most intimately acquainted with the condition and management of the University. It was recognised so long ago as 1846, when a Bill for the sale of the present grounds and buildings of the Monklands Junction Railway Company and the transference of the college to a new site on Woodlands was passed by both Houses of Parliament, and received the Royal assent. The failure of that measure was only caused by the inability of the railway company to implement their engagements. The reasons for removal became still more urgent than before. But the University authorities found no favourable opportunity for the renewal of the scheme till the year 1864, when a proposal for the purchase of the college lands and buildings was made by the City of Glasgow Union Railway Company, and a sale was accordingly effected with that company, under their Act of Parliament, at the price of 100,000*l*.

Designs were then obtained from Mr. Scott, the necessary money was raised, and the new buildings, as we see them, have been completed.

They form a large oblong rectangular pile, about 600 ft. long, speaking broadly, by 300 ft. wide, and divided in the middle by a building which separates two quadrangles, each of which is about 180 ft. square.

The whole block of the buildings may be divided into,—

1. The south front, with the west angle tower at the north front, containing the art and science class-rooms, with extensive laboratories, in connexion with the natural philosophy and chemistry.

The great tower in the centre of the south front forms the main entrance for the students; on the first-floor is the court-room, with direct communication into the great forehall (yet to be built). Besides the belfry, clock-room, &c., in the upper stages, there is the cold-air chamber in the sub-basement, through which every hour 1,000,000 cubic feet of fresh air are to pass, for the supply of fresh and hot air for the heating and ventilating of the whole building, the cold-air chamber being fed through four large extraction shafts in the east and west walls of the main tower, terminating at a height of about 150 ft. The tower is 200 ft.; the wooden spire, covered with lead and slate, 110 ft. high. There are the examination-hall, and the great staircase at the east of the main tower; and the senate-room on the first-floor at the west.

2. The east building comprises all the medical class-rooms, with the laboratories in the basement. With each class-room is a professor's private room, in connexion with a mezzanine above, fitted up as a private library or museum, as the case may be.

The students' platform in all the medical and other demonstrating class-rooms is raised in a curvilineal system, worked out by Dr. Allen Thomson, to 8 ft., 9 ft., and 10 ft. above the floor line, and reached by a separate staircase: in those cases there are two separate entrances for the students.

3. The north front, the centre portion, with a circular end, containing the students' general meeting-room in the basement, the reading-room on the ground-floor, the valuable collection of books and coins by Dr. Hunter, on the first floor, from whom it derives its name, the Hunterian Museum. East of the centre building is the general museum, with its laboratories and workshops in the basement; west, the library, containing over 100,000 volumes, with extensive premises for workshops, &c., in the basement.

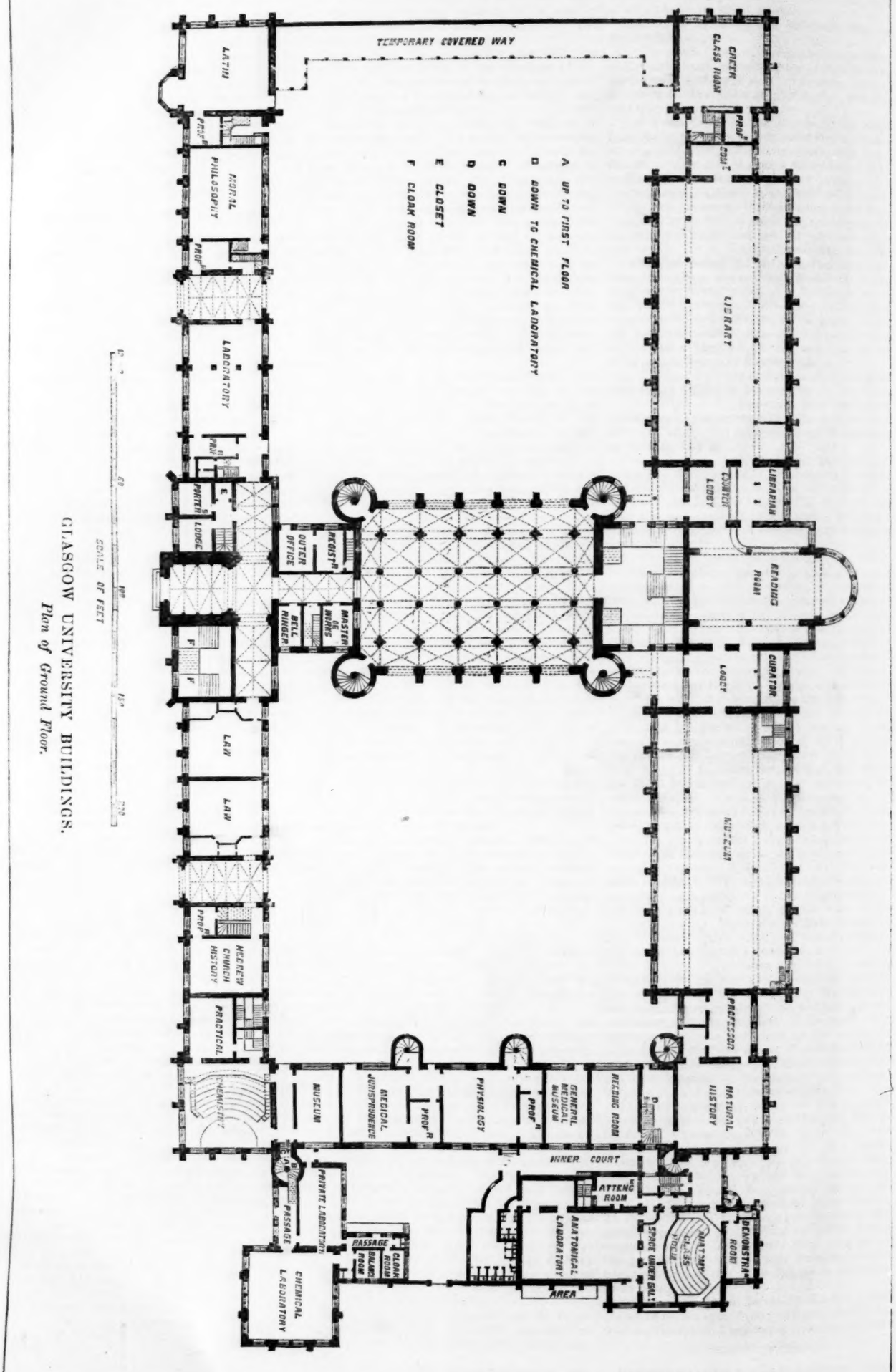
There are two carriage-entrances through the two gates on the south front, leading to the courts; a carriage-entrance on each side of the centre building, on the north front. The level being 16 ft. below the level of the court, the same is reached by a large staircase; the commencement to the large staircase in connexion with the great hall, for the whole of the foundations, is completed to the ground line. There are provisions for three large hoists, in the library, the museum, at the east buildings, to be worked by steam. The attics at the east and south buildings, 10 ft. 6 in. average height, are used for model-rooms and museum purposes.

4. The professors' court, at the west of the College buildings, consists of thirteen houses, in lieu of those in connexion with the old college; the whole standing on a lower level of 15 ft.; a block of two houses, on a line with the south front, forming the south block, the residences of the principal, the Right Rev. Dr. Barclay, and of Dr. H. Caird, professor of divinity; seven residences, forming one block to the west; four residences, forming one block, to the north, arranged for further extension. To the west is the students' recreation-ground, about 5 acres, with the new hospital, to be erected farther west, which will form the extent of the scheme.

The dimensions of some of the principal apartments are as follow:—Library, 129 ft. by 60 ft.; museum, 129 ft. by 60 ft.; central hall, 114 ft. 6 in. by 70 ft.; Latin, chemistry, natural history, and Greek class-rooms, each 40 ft. by 40 ft.; laboratory, 52 ft. 7 in. by 34 ft.; moral philosophy, 37 ft. 10 in. by 34 ft.; medical jurisprudence, 34 ft. by 30 ft.; physiology, 34 ft. by 34 ft.; small museums, each 30 ft. by 22 ft. 6 in.; reading-room, 73 ft. by 51 ft. Our plan shows the ground floor of the main building and the basement floor of the low buildings on the right-hand side.

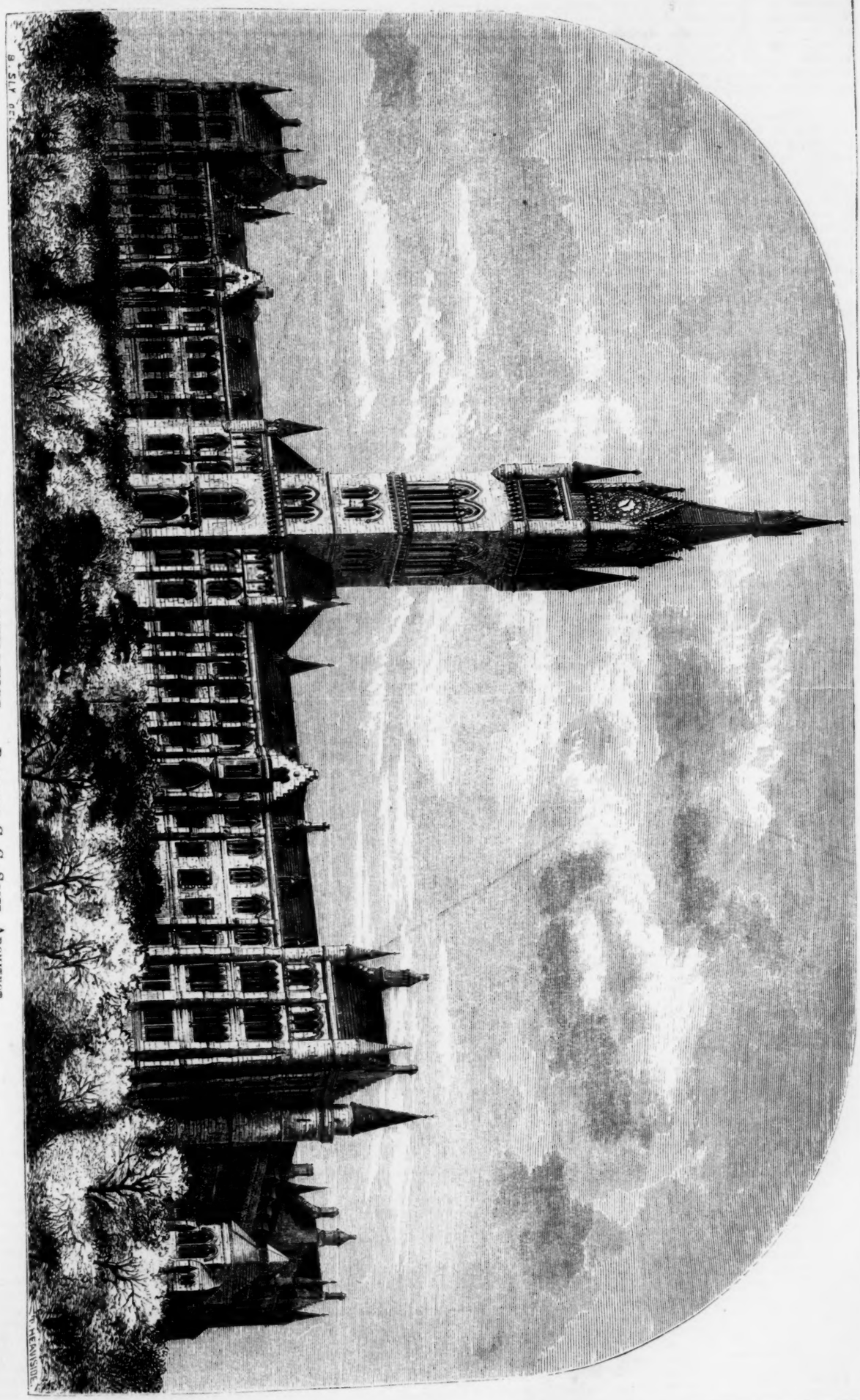
Mr. W. Conradi has been Mr. Scott's representative on the spot during the progress of the works. The amount expended is about 420,000*l*.

Coggeshall, Essex.—Endeavours are being made to obtain a town-hall for Coggeshall.

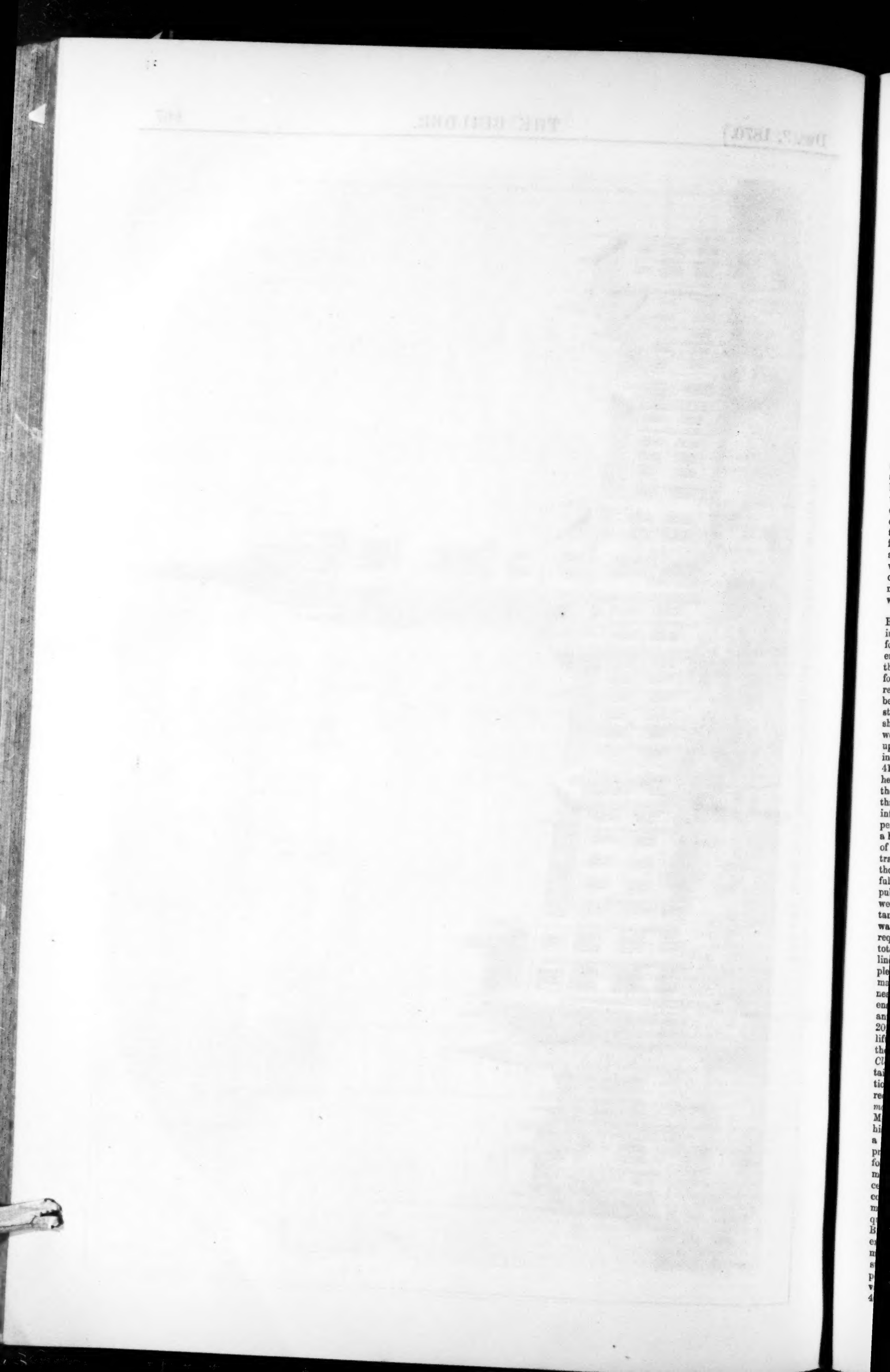


GLASGOW UNIVERSITY BUILDINGS.

Plan of Ground Floor.



GLASGOW UNIVERSITY BUILDINGS.—PROFESSOR G. G. SCOTT, ARCHITECT.



IMPROVEMENTS IN THE PORT OF DUBLIN.

THE Dublin Port and Docks Board are now carrying out extensive improvements near the entrance to the Liffey, on the south side of the harbour, which, when completed, will add considerably to its position as a commercial port. The object of the improvements is to give an increased depth of water, so that vessels of the deepest draught can enter and remain afloat at all stages of the tide; in fact, to convert the river so to speak, into a large tidal or floating dock. The present river walls, built upwards of fifty years ago, were founded at a depth of only 1 ft. or 2 ft. below low-water; consequently the bed of the river could not be dredged close to the walls without endangering their stability. Mr. B. B. Storey, C.E., engineer to the Port and Docks Board, designed a new wall, to be built in the same line as the old wall, with the foundations so low as 25 ft. below low-water, to enable him to have the river dredged with safety to the depth of at least 20 ft. below low-water, thereby, as the rise of the tide is about 13 ft., giving a total depth of 33 ft. at high-water. To form an idea of the extent of the work, we may state that the new wall is 20 ft. broad at the base, and is 42 ft. 6 in. in height, and is built up to the level of about low-water with large blocks of rubble-faced to that height, with close-dressed calp or limestone face-work. From low-water to top coping, which is 5 ft. above high-water, is faced with close-punched and draughted granite ashlar, laid in horizontal courses, and coped by weighty granite cope 2 ft. in thickness, and covering the whole top of the wall, which narrows, by stepping at proper intervals, to 5 ft. wide at top.

About August of last year the Port and Docks Board received tenders for carrying this work into execution; and the coffre-dam necessary for the exclusion of the tidal waters, so as to enable the old wall to be entirely removed, and the excavations carried out the 25 ft. below the foundations of the old wall, until the bed for the reception of the new masonry was prepared, being the most important feature in the construction, it was thought best that the contractor should design and carry out this part of the works at his sole risk, as so much depended upon its proper stability and resisting qualities in going to so great a depth, having 38 ft. to 41 ft. of head of water to riverside, and 43 ft. in height of quay and roadway to be supported on the land side, and also as it was further expected that a large quantity of water would find its way into the pit, so much as 20,000 gallons of water per minute were expected to have to be pumped a height of 43 ft. The board selected the tender of Mr. William J. Doherty, C.E., of Belfast, contractor (although not the lowest by several thousand pounds, but known as having successfully carried into execution several important public works about Belfast, &c.). Operations were commenced immediately after the acceptance of the tender, and have been pushed forward to insure its completion within the requisite time,—namely, three years. The total length of wall to be rebuilt is 1,050 lineal feet. The coffre-dam has been completed for one-half the entire length, and the masonry of the new wall has been built for nearly 350 feet. The contractor has been enabled to avoid the great quantity of pumping anticipated, and instead of having to deal with 20,000 gallons of water, the actual quantity lifted is about 1,000 gallons per minute; so that the excavations and masonry are perfectly dry. *Clay puddle*, of which the dam is made, retained by close piling, driven below the foundations of the new wall, was not procurable when required, and the contractor substituted *peat moss*, easily procured by canal from the county Meath; and it is said to have more than realised his expectations of it. However, he has found a stratum of *clay silt* in the excavations, that provides him now with all the puddle required for the remainder. The masonry of the new mill is built entirely throughout with Portland cement, the mortar being formed in a pliant concrete mixed in suitable mills. This class of masonry and mode of mixing the concrete are quite new, being introduced by the engineer, Mr. B. B. Storey, and no settlement or irregularity exists. Pumping, pile-driving, mortar-mills, mixing and hoisting, are performed by five steam-engines, in the aggregate of 80-horse power. About 400 men are employed in excavating quarrying-stone, building, &c., and 35 to 40 horses in bringing the stone to the works.

The stone is lowered into place by means of three over-head travelling gantries traversing and spanning the entire width of foundations, having on each a set of jennies or movable crab winches of great strength, the uprights and runners of the river side of the gantry staging being supported on the piles of the outer row of the coffre-dam, and the supports of the inner line resting on the quay space within the works. In addition to the piling of the dam, there is also a row of close sheeting and strutting piles driven the entire length on the inner or land side, to support the roadway; the width between the coffre-dam and the back piling being 30 ft.; while timber struts and walls, at about 5 ft. vertically, and 10 ft. horizontally asunder, are placed throughout to resist the pressure of the water and foreshore against the coffre-dam on the river side, and the pressure of the roadway on the land side. The cost of this work will be, when completed, about 65,000*l.* to 70,000*l.*

THE BLOCK-BOOKS.

I THINK your readers will agree that the burden of proof in this controversy rests with Mr. Holt, for when any one challenges opinions generally received, it is for that person to prove that the statements on which those opinions are founded are false. Therefore I hope Mr. Holt will tell us his reasons for rejecting the following statements respecting the antiquity of the "Biblia Pauperum." These I quote in answer to his words, "I challenge literature to prove that a copy of the Block-book known as the 'Biblia Pauperum' was actually in any library, public or private, prior to 1485, or known then to be in existence." They are the opinions of Mr. H. N. Humphreys and M. Berjeau, who, by careful study of the Block-books, are well qualified to judge, and moreover they are the gentlemen specially referred to by Mr. Holt.

"I passed a portion of last autumn at Munich, where I undertook a careful examination of the Block-books contained in the Royal Library—one of the richest collections known. No. 24 of that collection is a 'Biolia Pauperum,' the blocks of which are pretty closely copied from the original Dutch edition, though somewhat enriched in the style of ornamentation, and other details. It is printed on both sides of the paper in printer's ink, and *bears the date* 1470, with the printer's mark. There is also another edition from the same block (No. 23) printed in distemper for colouring, and which bears the same mark and date. A third 'Biblia Pauperum' of the same collection, printed in printer's ink from entirely different blocks, and of very inferior execution, bears the date 1471. Here then are at once no less than three of the latest specimens of the 'Biblia Pauperum,' all printed long before 1485. There is also an edition bearing the name of its printer or engraver, Hans Sporer, of Nuremburg, dated 1475. He is a well-known man, and in his last work gives in addition to his name his address behind the Church of St. Martin. Those Block-books which are printed in printer's ink on both sides of the paper were evidently produced at a period long posterior to that during which the Block-books were printed in distemper, and on one side of the paper only, these peculiarities and their style of art, placing them, in the opinion of most bibliographers, full fifty years before the latest of the dates just referred to." (H. Noel Humphreys, letter to the *Times*, August 21, 1868.)

"To saddle upon Albert Dürer the drawings of the 'Biblia Pauperum,' which are scarcely worth the pencil of a glass-stainer of the twelfth or thirteenth century, is too bad. To think that the artist who drew the 'Canticum Canticorum' in the purest style of the Van Eycks was likewise Albert Dürer, is to show an ignorance of the Mediæval art perfectly astounding. The artist who made the drawings of the 'Biblia Pauperum' could no more draw those of the 'Canticum Canticorum,' than the artist (whoever he may be) of the 'Livre des Sauvages' could copy the 'Source' of M. Ingres. I must acquaint Mr. Holt with the stubborn fact that if Albert Dürer engraved the blocks of the 'Speculum Humanæ Salvationis,' he must have engraved them in the womb of his mother, for he was born in 1471. Then the 'Speculum' had had four editions, two Latin and two Dutch. As new editions of books did not follow each other in those early times as quickly as they do in ours, when they catch the fancy of the public, to say nothing of the time used in engraving and printing them by two different processes,—first, the woodcut with the 'frotton,' then the movable types with a press,—we may admit a period of at least twelve years before the curiosity for the folio edition of the 'Speculum' was exhausted. Just at the end of it Veldener cut the blocks in two, in order to illustrate a 4to. printed edition, which he published exactly twelve years after the birth of Albert Dürer." (M. Berjeau, *Notes and Queries*, October 31, 1868.)

"Mr. Horne possessed a volume in the original binding, which contained three of the most celebrated Block-books,—the 'Biblia Pauperum,' the 'Apocalypse,' and the 'Ars Moriendi.' Within the binding was the following memorandum:—'Hic liber religatus fuit per Plebanum ecclesiæ anno Domini 142 . .'—the last numeral being very indistinct, the date may fairly be taken as 1425. All three books were in circulation at that time; and allowing for their having followed each other at certain intervals, 1410, or thereabouts, would be an exceedingly probable date for the publication of the first of them." (Humphreys, "Hist. Art of Printing," 40.)

There is a copy of the "Biblia" in Lord Spencer's library, with the date 1467 on the hogskin binding.

F. S. A.

THE PROPOSED TUNNEL UNDER THE MERSEY.

IT would appear that the promoters of the Mersey Railway Tunnel scheme have not abandoned their project of uniting Liverpool and its Cheshire neighbour by subterranean means. They are now preparing plans to submit to Parliament next session for an extension of their pesent authorised line, which is from the corner of Church-street and Paradise-street, Liverpool, to Birkenhead. They now propose to carry the line from Paradise-street to a junction with the new station in Ranelagh-street, at or near the site of the Roscoe Arcade; and, on the Cheshire side, from Woodside to a junction with the Birkenhead and Chester Railway, at or near to Green-lane, Tranmere. Mr. Dixon, the company's surveyor, professes to have secured most favourable levels from the Tranmere junction, under the bed of the river, and thence to Paradise-street and Ranelagh-street. There will, therefore, it is thought, be no necessity for resorting to engines on Fell's Mont Cenis principle, the ordinary locomotives being perfectly competent to mount the easy gradients proposed to be made.

RELAPSING FEVER IN LIVERPOOL.

A REPORT of the *Lancet* Sanitary Commission on this subject justifies a warning we have repeatedly given as to building on made-up ground where ashes, mixed with vegetable and other organic *débris* have been accumulated. The reporters attribute the fever to this cause. As to "the site" they say:—

"This superb site the jerry builders, contractors, and the Corporation have done, and are still doing, their very best to spoil. Whole tracts of land from which the surface-clay has been removed for making bricks have been filled in with millions of tons of chemical refuse, composed largely of sulphide of calcium. The houses are built upon it, and the sewers pass through it. The sulphide is slowly dissolved out by rain, and the solution gives off a stench of sulphuretted hydrogen when it enters into the sewers or escapes upon the surface. As in Manchester, so also in Liverpool, hundreds of houses have been erected upon midden refuse. . . . The most remarkable feature in the case is that this mode of dealing with the ashpit refuse is justified by the medical officer of health. Dr. Trench is reported to have visited this very spot [one indicated in the report], and to have perceived no smell. But it is a significant fact that a load of vegetable refuse was picked from the very surface, and that the Corporation officers stated that they did not dare to move the whole lest the stench should be too great. No houses can be healthy that are built on such a subsoil, and no sewers can be kept free from noxious gases under such untoward circumstances. The practice shows how easily the judgment of sanitary authorities may be warped by the question of expense. But better a thousand times that the Corporation should erect furnaces and burn such refuse, or carry it out to sea, than that they should thus employ it in fouling their own nest for generations yet to come."

The subject has been under discussion in the Health Committee, where a letter from Dr. Trench, in reply to certain statements of Dr. Stallard, was read. The result was, that the Health Committee has wisely resolved to ask the president of the British Association to name two scientific gentlemen to investigate the matter. This was done at Dr. Trench's suggestion, although he stated that such sites as those based on ashes are healthy; the slow smouldering process of Eremacausis, or combustion at common temperatures, so disposing of the organic matter as to obviate all danger to the health, as completely as if such matter were

burnt in a furnace. Does it? That seems to be a serious question. The heating of dung at common temperatures will no doubt rot such matter, and ultimately dispose of it as completely as if it were burnt in a furnace; but *during* the process what takes place? It is a ticklish word, "Eremacausis," to trust to in such a case, however different the process may be from the common heating of dung at ordinary temperatures. Hydrogen is an indomitable volatiliser in its stinking combinations with sulphur, phosphorus, &c., although it may, under various circumstances, quietly associate with carbon into liquid or even solid forms, as well as gaseous, too, in such slow processes as those indicated. No doubt oxygen, also, may convert it into harmless water; but the whole subject needs more light to be shed upon it, and meantime we still regard the casting of midden-heaps into sites for houses as a dangerous practice.

WEST HAM SEWAGE.

The West Ham Local Board of Health, being under statutory obligation to discontinue the discharge of sewage into the River Lee at Bow Creek, have determined to apply forthwith for Parliamentary powers to enable them to carry out a scheme prepared by Mr. Lewis Angell, engineer to the Board, for lifting and conveying the entire sewage of the district a distance of about four miles from the present pumping-station, to a farm at Little Ilford, which the Board proposes to purchase for irrigation purposes.

CEMENT FROM GAS LIME.

Only a few months ago there appeared in the pages of the *Builder* a notice of the application of gas lime to the manufacture of cement, and its use for plastering and decorative purposes. I am now in a position to report that the Prideaux cement has been tested in a variety of ways, and bids fair to become an important manufacture. In Sheffield upwards of 700 tons of gas lime have been worked up. The larger part has been applied to walls and floors, hearthstones, and mantelpieces. Of the latter, about 200 have been moulded and sent out. In four of the busiest parts of the town causeways have been paved by laying the cement with a certain proportion of broken slags from the neighbouring furnaces. These have stood the late rains very well, and are likely to come into close competition with the asphalte usually employed. Perhaps the most happy application of this new material is for floors and roofs. Old boarded floors of warehouses have been covered with about an inch layer, and even in workshops where polishing machinery keeps everything in vibration, the Prideaux cement stands intact. I have daily inspected the roof of a shed which had been covered with the cement. Upon a light frame of wood the material was laid on and trowelled to a smooth face, and in the space of twelve hours it was hard enough to bear standing upon. The rain-water now washes over it without the slightest trace of white particles, nor is there any alkaline reaction to be discovered on the hardened surface. The smoothness of walls and plinths moulded with the Prideaux cement is very striking, and must recommend it strongly to builders.

Now, it may be asked, what is the composition of a cement which possesses these useful properties? It is not a Portland or a Roman cement, although some hydraulic characters are very distinct. It does not set so quickly, but allows more time for finishing up the faces of moulded work. It is far from common mortar; for without any sand it can be formed into blocks which set hard throughout. A piece of a mantelpiece which had been made some six months, gave the following results upon analysis:—

Carbonate of lime	69·08
Sulphate of lime (hydrated)	22·63
Calcic hydrate	1·36
Calcic sulphide	*trace*
Insoluble matter	6·50
Alumina and oxide of iron	·45

It is obvious from the above that the setting must at first be due to the combination of water with the dehydrated calcic sulphate, or, in other words, the plaster of Paris formed by the calcination of the cement. The quantity of caustic lime which is present in the cement keeps the plaster of Paris always fresh, that is dehydrated, until mixed with excess of water employed at the moment of using it. This will account for the fact that the cement does not lose its qualities by keeping, as the hydraulic cements do. After the plaster of Paris is set, the caustic lime goes on absorbing carbonic acid, and thus indurating the mass in the ordinary manner of lime mortars.

This will be better understood by the following partial analysis of a sample of the cement ready for use:—

Sulphate of lime (dehydrated)	17·46
Caustic lime	54·00
Alumina and oxide of iron	5·00
Insoluble residue	4·15
Hygroscopic water	·24

Now when it is considered that such a material is made from a waste product of a most offensive kind, this invention deserves every fair trial of its merits. Gas lime is a necessity if the best and purest gas is wanted. Only the expense and annoyance of its removal drove London gas companies unwillingly to replace it partly by the ferric hydrates. It is pretty certain that with a market for the waste product they would gladly return to lime purifiers, and it may be predicted that the Prideaux cement manufacture will surely bring on this revolution.

William Baker,
Associate Royal School of Mines, London.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the last meeting, on the 23rd ult., seventeen members were elected, and numerous donations were announced, including one of 30*l.* from the Earl de Grey and Ripon, towards the Illustrations of Fountains Abbey, in the forthcoming part of the *Collectanea*, and one of 5 guineas from the always-liberal Sir William Tite, C.B.

Exhibitions were made by Mr. Baily of several objects recently found in London, amongst which were some ink-horns, with the arms of Charles X. of France, and thirty silver coins of Ethelred, detached, nearly perfect, from an immense agglomeration of decayed silver money, found in St. Martin's le Grand; and by Mr. C. Brent, F.S.A., of a pair of three-rowel spurs. A paper by Mr. Cuming, on the cross-tau in painted glass, was elaborately illustrated by drawings by Mr. Watling, of Stonham, principally selected from Southwold Church. Mr. Dillon Croker, F.S.A., read an elegant paper on "The Legends of the Wye."

The next meeting will be held on December 14th, at eight o'clock, when a paper by Mr. Charles Rœssler, of Havre, will be read, "On a Roman Pavement discovered in August last in Lillebonne." He states that the position in which scientific societies find themselves in France precludes the possibility of any record of this discovery being made there; and the council have, under the circumstances, yielded to his desire that such record should be made in their journal.

THE "TENDER" SUBJECT.

Sir,—Your article entitled "On Several Subjects: Some of them Serious," is extremely interesting. Will you allow me to ask a question or two as to the appointment of quantity surveyors? The builders say that they, and not the architect, should appoint the surveyor; or that one surveyor should be appointed by the builders and another by the architect, and the quantities should be based upon their joint and agreed calculations. The point upon which I wish information is, how, in this case, can an architect keep from the builder the list of firms who are to tender? My own experience is that when builders know who are to submit estimates, they frequently arrange between themselves who is to have the work, and the lowest tender is the sum which a builder is willing to receive for the work, plus other sums to be paid by him to other builders to keep them out of a real competition.* In my own practice, I would, if I knew how, and could properly protect my client, allow the builders to appoint the surveyor, subject to my approval of him as a man who would not be likely to take the quantities in excess; but I am afraid that if it were a rule that the appointment of the surveyor was entirely in the hands of the builders, the surveyor who took out the quantities most "full," as it is termed, would have the largest practice.

The only remedy which I can suggest to prevent the various anomalies which occur with regard to quantities is for the architect to appoint the surveyor, and to make the bill of quantities part of the contract; so that any error discovered in them should be allowed for in the builder's final account,—that is to say, any omission in the quantities should be made an extra to the builder, and any excess in the quantities should be deducted from the contract amount, or treated as omitted work.

H. A. B.

* Can our correspondent give us proof of any such arrangement actually made?—Ed.

Sir,—I am surprised to see the discussion in your paper on the estimates for Nos. 3 and 5, Buckingham Palace-road, because there is in reality nothing very unusual in the case. All connected with the building trade, or who read your paper, must be aware of the immense difference in the tenders for almost every job competed for. Now I am very anxious to know what explanation the builders themselves can give of the matter, and will therefore briefly dispose of the points stated by your correspondent "Audi Alteram Partem."

First of all, then, it is my practice to employ some one to take out the bills of quantities, but in this case it was not possible, in consequence of the short time allowed for preparing everything and commencing the work. Plans had to be prepared, specification drawn up, bills of quantities delivered, and the estimates received, all in *three* weeks; nor had I any power to alter this. There was no favour shown; all had the bills of quantities at the same time, and were therefore in the same position.

Secondly.—The few items cited by your correspondent were errors of the lithographer, and were explained to many of the persons who applied for the bills of quantities. They were, however, mere trifles, and could have made very little difference in the amount of the estimate; indeed, so small that it was thought better to treat with the successful competitor respecting them, than cause any delay in issuing the document. My own estimate for the work was 1,300*l.*, which I thought would be a fair value for the job. I am still as much in the dark as any one else as to the cause of the wide diversity of the estimates, and wish some one would enlighten me.

John Dale.

Sir,—I am very glad indeed to see by your leading article of this week's issue that your able pen is now pointed and directed towards unveiling that which, I am convinced, without your weighty and time-honoured influence, would remain a discreditable mystery. I trust, for the sake of our profession at large, and that highly honourable and intellectual body of men (the builders), you will not let this "tender" subject rest without a solution.

I am certain you will not get the truth from ——, and that from this source the mystery will never be revealed to daylight or properly ventilated; but, on the contrary, nothing but dark and still darker shadows will be the result of applying there. It is, indeed, a good thing for the public and our profession generally that your editorial eyes are always open to correct these abuses, and I trust they may ever prove a terror to evil-doers.

A Thorough Believer in the "Builder."

P.S.—I enclose my card, in case you wish for any information I could give.

WRAYSBURY CHURCH TOWER AND SPIRE.

Sir,—In your last you say you should like to know if all the builders were supplied with quantities, &c. The great discrepancy in the tenders naturally calls for some inquiry of this sort, as it seems to reflect on some one.

In justice to the architect, who is a stranger to me, except by reputation, I would say, never was a fairer competition. Quantities were not officially supplied.

I saw the advertisement in your journal first, and was also invited to tender by the vicar of Wraysbury: having just completed the reconstruction of the parish church, Windsor, satisfactorily, he said he should like me to do this. I took my quantities from the drawings, which were lying at Wraysbury for the purpose. I know quantities could be obtained, but have not seen them. Those quoted by you seem pretty correct, except the Bath stone. I do not make so much by 1,484 cubic feet, and still could not do the work for less than my tender, 1,399*l.* In fact, from experience, I can say the work, according to the plans and specification, is honestly worth that sum.

E. W. Kelly.

*** A number of other letters on this subject reached us too late for consideration.

"ARCHITECTURE GIVEN IN."

Sir,—I have just now found the following amusing advertisement in a newspaper:—

"The New Education Act.—Economical, Substantial, and Well-arranged School-buildings.—Messrs. CUT & RUN are prepared to contract for the erection of New Schools, or for the enlargement of existing Schools, at the rate of from 2*l.* 15*s.* per head, according to accommodation and situation. The plan, specification, and superintendence (by an experienced and highly competent architect) included. Teachers' residences will also be contracted for at proportionably moderate cost. Speedy completion guaranteed.—Address, ——, Newport, Mon."

A tailor keeps a poet on the premises, why should not builders keep An Architect?

BRIBES.

SIR,—*Apropos* of your remarks relating to nefarious practices in our profession, curiously enough, the same morning on which I received your paper I also received the enclosed note:—

"Dear Sir,—I should be very pleased at another time to give you an estimate, if you might feel disposed to put me in the way of one. Hoping it would be more profitable than the present one, Yours faithfully,

* * * *

P.S.—I have made you a small present of 5*l.* for your kindness and attention to my payments throughout the job, hoping you will accept it."

This contractor was introduced to me by my client. It is the first business I have had with him. The accounts have yet to be passed by me. Need I add that I returned the money at once, in a letter, expressing my surprise, and pointing out to him that it is as wicked to try and bribe, or to throw gold-dust into an architect's eyes, as it is to bribe a judge in court; that the architect occupies a similar position between the employer and employed; and expressed a hope that he would give up this wicked system?

I fear these practices are too common between architects and builders. Indeed, I know some men who not only take gifts from builders, but who tell the parties tendering to include so much money in their estimates for themselves. Especially is this done when architects offer their services gratuitously, which, being interpreted, often means getting their commission from the contractor, instead of having it direct from the client.

I wish some of the leading members of the profession would take the matter up and see if something cannot be done to purify the profession in this respect, and remove the misplaced stigma which overhangs those who act honestly in these matters. Many thanks for your kindness in ventilating the subject in your paper.

HONESTY.

THE WANT OF ARCHITECTURAL INSTRUCTION IN MANCHESTER.

SIR,—In reading the account of the annual meeting of the Architectural Association in your paper, I was much struck with the many opportunities afforded to London pupils for the study of their profession. Happening to be a pupil in Manchester, I could not help feeling what a great boon a course of some such lectures as those of which the Society gives a list would be to the many pupils in Manchester, who are desirous of mastering their profession, but who are strangers to any such facilities as those enjoyed by London pupils.

Of the many able men who constitute the Manchester Society of Architects, are there none who are willing to give up a little of their time in delivering lectures suitable to architectural pupils, and could not they bring their influence to bear upon opening a class, where instruction would be given in the different branches of an architect's education? I feel certain that anything of the sort would be not only welcomed but warmly supported by the pupils in Manchester; and if some such plan were only tried, I have no doubt that it would, by its complete success, entirely compensate those who might be the originators. If the members of the Society would ascertain how many even of their own pupils would be willing to attend and support such courses of lectures and classes, they would, I think, find that the number would be quite enough to give the plan a trial; and if it once became known that such an opportunity existed, no doubt many who are not pupils of members of the Society would avail themselves of it.

By kindly inserting these few remarks in your widely-circulated paper, perhaps this subject will be taken up by those who will use their influence in supplying a want that is grievously felt in Manchester.

A MANCHESTER ARCHITECT'S PUPIL.

MEMBERS OF "THE INSTITUTE" AND THE PROFESSION.

SIR,—There are two or three questions now prominently before the public, most seriously affecting the interests and well-being, I might almost say the future existence of the profession, as also the position and dignity of its members; and it has occurred to me that it might be well to bring them again under the notice of your readers, in order that some discussion may take place, with a view to putting matters on a more satisfactory footing.

In the first place, the subject of architects' charges, and the retension of their drawings.

A recent case (Ebdy *v.* M'Gowan) has been decided against the architect, his claim on the plans being disallowed; and, although it appears to me this was not a good case to contest (as it is doubtful, when no visible result was obtained by the employer, whether a claim could be established), still the effect of such a decision is to fix the idea in the public mind that an architect has no right to retain his plans under any circumstances.

If this is the *law*, it had better be settled at once, because then architects can protect themselves, by making it a part of their agreement with their employers, that they should retain their drawings, which most sensible men would do, knowing well the amount of extra trouble (and probably disputes) which will arise, if the original plans go out of their own possession; or else they would have to charge, in self-defence, a higher rate than 5 per cent.

Besides which, if an architect has no right to retain his drawings (which are merely the instruments by which he directs the erection of a building), what right has, as your correspondent puts it, "a sculptor to keep his models, or a solicitor the drafts of deeds, &c.,"—and where is the line to be drawn?

It would appear, from the report of this trial, that a solicitor has no right to retain the draft papers when a case is terminated by his client giving it up; but the ordinary practice is, I believe, for lawyers to keep both drafts and deeds, and all papers involved in getting up a case, instructions to counsel, &c. An engineer's or iron-founder's drawings, patterns, and models are a similar instance, being the stock-in-trade also; and if they were to be claimed, he would have to charge a very different rate for his work.

Of course, the public are anxious to get all they can for their money; but why should architects fare differently to other practitioners?

The chief reason is, I fear, that they let themselves down, and do not maintain their proper position. I am not speaking of second or third rate men only, but leading members, and even Fellows of the Institute.

With regard to the "Barry case," it will be a very great mistake, in my opinion, if Mr. E. M. Barry (as stated in your journal of Saturday last) has decided on giving up his property at the arbitrary demand of the Government, and I should not comply with it were I in his position. In fact, if judgment be allowed to go by default in this manner, it will be much more difficult to contest a case successfully hereafter. Nothing would induce me to give up the drawings, under such circumstances, unless absolutely obliged.

In the second place, the quantities question, and commission on contracts.

Whatever may be the custom in London, it is no secret that in the provinces it is a common thing for "Fellows of the Institute" to take out their own quantities, and, in some instances to receive payment from the builders, by way of a percentage on the amount, charged at the end of the bill, and without their client's knowledge; the percentage varying very much, and frequently in an inverse ratio to the completeness of the calculations; so that, whilst competent surveyors willingly take them out at 1½ per cent., some incompetent architects (or their clerks) commonly charge 2½ per cent.

Of course, they would plead that the customs of provincial towns are different from those in London, and that the rule prevailing there, of quantities being taken by independent surveyors, would not apply; but I should like to know whether the clause in the declaration, signed by members of the Institute, on election, "that they will not receive or accept any pecuniary consideration or emolument from any builder or other tradesman, whose works they may be engaged to superintend," does or does not apply to an architect receiving payment for quantities.

Such men, too, are not always above taking a commission also from contractors, large or small, and from tradesmen supplying the various articles required, such as ironmongery and fittings of various kinds, many of whom are in the habit of making such allowances in the ordinary way of business.

Now this is the sort of thing that brings the profession into disrepute, for the public are not able to distinguish always (perhaps not often) between the man who will do these things and one who will *not*. Therefore they are all thought to be much about the same, unless in certain exceptional circumstances, where the character of the architect or peculiar events have enlightened the mind of the public.

So dense, indeed, is the ignorance on this subject, that in some instances where an architect stands out for the usual commission, and no per centage from contractors, he loses the work, and has the mortification of finding himself underbid by men who are not so scrupulous. I could name instances where this has been done by Fellows of the Institute.

I would ask, of what use is it to make rules that members are not to do such things, and wink at their being done? Would it not be better for the council to expel any Fellows or Associates who transgress these or other rules?

This would put the Institute on a higher level than it at present occupies, and would make it a real distinction to belong to it, instead of, as now, being no guarantee from such objectionable practices.

If this were done, I would promise them they would gain thereby at least one member, in the place of some they might possibly lose.

E.

TAR PAVEMENT.

IF the ground is well rammed, the specification of pavement I sent you will give satisfaction. It does so here, where it replaces gravel paths. It is not usual to prepare a foundation for York flag, nor is it more necessary for tar pavement for footpaths.

THOS. H. METHVEN.

Gasworks, Bury St. Edmund's.

WANTED, A LIFE-BOAT.

SIR,—It has occurred to me, and I doubt not that others have thought the same, that all who are engaged in the various professions and branches relative to building, from the architect to the labourer, could and would further the laudable efforts of the Life-boat Institution, by subscribing to a fund, so as to present it a boat and all fittings. Many professions, trades, and societies have done so, and surely the builders will not be one of the last to do such a good and noble action. I shall be glad to forward my mite or help in the cause if the matter be taken up.

LIFE BUOY.

CITY TOWERS.

SIR,—Will you use your influence to prevent an act of Vandalism? The beautiful church of St. Mary Aldermary has, by the construction of Queen Victoria-street, been brought conspicuously into view. Its tower is unique, and is one of Sir Christopher Wren's finest works. Can it be believed that the Metropolitan Board of Works have erected a huge board, announcing that the piece of land (only a few yards in extent) between the tower and the street, is to be sold or let on building lease? Comment is needless.

S.

BULLIVANT'S PATENT SASHES AND FRAMES.

THE objects endeavoured to be attained by this invention, to which reference has been made in our pages, are the exclusion of air and dust more perfectly than any of our ordinary methods have hitherto succeeded in doing, and the giving of greater facilities for cleaning, painting, and repairs. The weights, instead of being attached by lines to the sash in the ordinary way, are hung to a movable guide-bar, which is of the same length as the sash, and travels in a groove partly in the sash and partly in the pulley-stile. This guide-bar has attached to it a spring fastening running its entire length, which keeps it constantly tight-pressed against the pulley-stile and sash-stile, and two other small springs which keep it firmly home to the back of the groove in the pulley-stile, with the view of making the sash air-tight. A single screw passes through the centre of the side of the sash when in work, retaining the guide-bar firmly in its place. When this is removed, the weight in falling draws the guide-bar out of the sash, which is then entirely clear of the frame, both inside-bead and parting-bead being dispensed with. Any sash thus filled can be lifted out for cleaning by an ordinary servant; and the same facility applies in case of re-painting, with the advantage that as no beads have to be removed, no repairs to the painting of the frame are necessitated. In expensively-decorated buildings this is a point of importance.

The patent also includes an improved arrangement of pulleys. The ordinary cases are dispensed with; a screwed spindle passes through the head of the frame from side to side, upon which travel free the two grooved rollers, either of iron or brass, that carry the lines, the result being that no amount of wear interferes with the easy action of the sash; and there is this contingent advantage, that a Holland blind, if required, can be introduced into the head of the sash frame between the rollers, and be thus entirely concealed from view when out of use. The lines travelling in the groove which receives the bar are unseen from the front, and are not so expensive in first cost.

The danger of cleaning and painting windows from the outside now daily incurred, involving, as the police returns show, many serious accidents, is by this patent entirely avoided.

ARCHITECTURAL UNION COMPANY.

THE report to be read at the thirteenth general meeting of shareholders, to be held next Wednesday, the 7th, states that "The Architectural Exhibition Society have, since the audit of 1869, discharged the rent due for the exhibition of that year, but have not paid any of the rent due for the year 1870, amounting to 200*l.*, which causes the large arrear shown in the balance-sheet." The number of shares on the register is 1,037, upon which 10,370*l.* have been paid. The yearly account is made up to the 28th day of September last, inclusive, and the directors recommend the payment of a dividend of 11s. per share, free of income-tax, which will amount to 570*l.* 7s., leaving (in addition to 36*l.* 5s. belonging to the Auxiliary Donation Fund, and 8*l.* 10s. for unclaimed dividends) a balance in hand of 83*l.* 4s. 9d.

YOUR NEIGHBOUR'S MUSIC.

SIR,—It has come within my experience that when all other methods failed to stop the nuisance complained of by your correspondent, cutting off an inch from the ends of the joists—of course when they run at right angles to the wall through which the sounds are transmitted, has succeeded. The sound is, in fact, generally "conducted" from one house to the other by the floors, and hence the remedy is obvious.

E. INGRESS BELL.

*** In the case in question the joists run from front to back.

VALUE OF LAND.

MR. THOMAS BRASSEY, contractor, last week bought the Heythrop Park Estate, near Chipping Norton, Oxfordshire, the purchase-money being 113,200*l.* The estate comprises a mansion (damaged by fire in 1831, when in the occupation of the late Duke of Beaufort, since which period it has not been restored), seated in an extensive deer park, adorned with timber trees, and surrounded by several farms, with good houses and homesteads, embracing a total area of about 3,500 acres. The estate was sold under the direction of the Earl of Shrewsbury.

Liverpool.—At the Sheriff's Court, in Liverpool, before J. J. Aston, esq., Q.C., as assessor, and a special jury, a case, Paterson against The Cheshire Lines Committee, was heard. It was a claim in respect of a shop in Bold-street, under which the Committee had given notice of their intention to tunnel. The premises were old, and consequently the valuations proceeded on the assumption that it was

bare land, available at the expiration of the present lease, which had four years to run, for the purpose of the erection of more modern buildings. Most of the architects and surveyors in Liverpool were called as witnesses, the lowest valuation on the part of the claimant being 3,390*l.*, and the highest on the other side being 2,654*l.* The jury, after a long hearing, gave a verdict for 3,000*l.* The claimant's interest in the premises was leasehold under the corporation of Liverpool, at a nominal rent, for seventy-five years, renewable on payment of a fine, and the amount awarded was at the rate of about 25*l.* per square yard.

SIR CHRISTOPHER WREN.

Last week the Oxford Architectural Society visited, amongst other buildings in the City, the library of All Souls' College, and the drawings of Sir Christopher Wren, who was a Fellow of that Society, were inspected. The visitors were received by the librarian, Mr. Robarts, in the Law Library, recently erected under the direction of Mr. Bruton. Mr. Bruton briefly addressed the Society on the interest which attached to these drawings, as illustrating the office work as executed by architects of that period. He said there was no doubt many of the drawings were by the hand of Wren himself; others were those of his pupils, by one of whom the well-known twin towers in the large quadrangle of this college were designed. Among these drawings were several of St. Paul's Cathedral, and one for the re-construction of the streets of London, after the Great Fire of 1666. A plaster cast of the face of Sir Christopher Wren, taken after his death, was then shown to the visitors, who looked on it with much interest.

THE WASTE AND UNPRODUCTIVE LANDS IN THE CITY.

This important and rather serious subject came before the Court of Common Council on the 24th ult., in a motion by Mr. Isaacs.

"That the Coal and Corn and Finance Committee having in the years 1867, 1868, 1869, and 1870 called the attention of the Court to the large and increasing amount of unproductive lands in charge of the several committees of the Corporation, and the Court having ordered and obtained returns of the said unproductive lands, that it be referred to a Special Committee, to consist of the Chairmen of the City Lands, Bridge House, Markets, Improvement, and Markets Improvement Committees, and the Commission of Sewers, together with members of this Court, to confer with the said committees and commission, and to inquire into the present system of letting and disposing of such lands; and to consider and report whether any, and if any what, changes are desirable in respect thereof."

In the report which was presented last month, said Mr. Isaacs, it was stated that for some years the Corporation had been constantly adding to its surplus or unproductive lands, and had undertaken large bonded debts in respect of them. What was the cause of this? Not the slackness of trade, nor the tightness of the money market. Possibly the restrictions they imposed as to the kind of property that might be built were too many. Or, perhaps, they estimated the value of their land at too high a rate. The motion was carried in the face of an amendment to refer it to the four permanent committees mentioned in the resolution. The blank in the motion was then filled up with the number 12, and the committee was appointed.

INFIRMARY, BASFORD UNION.

Sir,—You will oblige by inserting the following statement:—

The undermentioned firms, all of Nottingham, were contractors at the above Union, in addition to Mr. G. Hopewell:—

Messrs. Dennett, fire-proof arches; Messrs. Danks & Nixon, fire-place blowers (designed by the architect), ventilating fire-grates, stoves, and baths; Messrs. Griffiths & Son, scullery ranges, hot-water cisterns, boilers, and two double hoists; Hopton Wood Stone Company, chimney-pieces; Mr. Hewitt, hot and cold water service, portable bath, and gasfittings.

The following were sub-contractors, all of Nottingham:—

Mr. Shipston, stone-masonry; Mr. Hewitt, plumbing and glazing; Mr. Doubleday, slating; Mr. Mundy, plastering; Mr. Rawlinson, iron-founding; and Mr. Burton, of Basford, painting.

Mr. R. Hancock, filled the office of clerk of the works. H.

CHURCH-BUILDING NEWS.

Carlisle.—The old Church of St. Mary, Carlisle, has been removed from its old habitation in the nave of Carlisle Cathedral. The galleries have been taken down, the ceiling has been removed, thus bringing into view the Norman arches near the roof, and preparations are being made for restoring the place to something like its pristine beauty. In the lath and plaster windows and the damaged piers are now plainly seen the traces of the barbarous taste of those who robbed the cathedral of one of its most interesting parts. The work of restoration will now proceed, the nave remaining in the meantime screened off from the cathedral transept.

Tattenhall.—The parish church of St. Alban, Tattenhall, has been reopened after extensive alterations. Shortly before the death of the late rector, the Rev. Fielding Ould, M.A., it was resolved, in consequence of the dilapidated state of the building, to have it completely restored. About twelve months ago the work was commenced under the direction of Mr. Douglass, architect, Chester, the contractor being Mr. G. Woollams, builder, Tattenhall. With the exception of the tower and the side walls, the building was entirely pulled down, and the work of enlargement and restoration commenced. The space formerly occupied by the old chancel was included in the main body of the church and extended in breadth, and a new chancel was built at the eastern end. The church, as it is now built, consists of a tower, a nave with side aisles, an organ-chamber and vestry, a lady chapel, and chancel. The tower is a square, embattled structure of stone, built in the reign of Henry VI. or Henry VII., and contains a peal of five bells. From the level of the leads, project short grotesque gurgoyles, and two empty niches, probably once containing figures of St. Alban and the Virgin Mary, occupy prominent positions above the new oaken door. Inside the tower is open up to the roof of the nave, but a screen of varnished pine, panelled with lights of coloured glass in geometrical devices, conceals the ringers from the view of the congregation. The west, or tower, window is of stained glass, the subjects being Scriptural. It was the gift of Mr. R. O. Orton, churchwarden. A stained-glass window, representing scenes in the life of Christ, is placed at the south side of the tower, and is the gift of Mr. J. Stephens and pupils. The nave is divided from each side aisle by four arches springing from pillars. The roof of the nave is supported by four principals, which, as well as the rafters, are of varnished pitch pine. The nave roof has been raised about 10 ft. from those of the side aisles, and in the intermediate walls on each side four clearstory windows have been pierced. The windows on each side of the aisles have been renewed. The old box pews have been replaced with open ones (a portion of which only are free), which are calculated to accommodate 500 persons. The walls not pulled down were redressed in the interior. The organ-chamber and vestry are on the north side of what was formerly the chancel, and form a sort of north transept, while a similar transept, called the Lady Chapel, is on the south side. The new chancel is raised, and in the centre is set with encaustic tiles. The foremost pews are more decorated than the others. The eastern window has been presented as a memorial of the late rector, the Rev. F. Ould, by his friends. It is of stained glass, and the principal subjects it illustrates are the Crucifixion and scenes in connexion therewith. In a window at the south of the chancel the stained glass which was formerly in the east window is replaced. The new porch at the south-eastern end of the church has been given by Mr. Brodbelt, merchant, of Liverpool and Tattenhall. Panels of parian are framed around by oak beams crossing one another, and in some places richly carved. Each side of the porch is pierced for three Gothic stained-glass lights. In this, as throughout the whole of the restoration, the character of the Perpendicular style of Gothic has been preserved. The cost of the restoration is about 3,500*l.*, of which over 3,000*l.* have been already subscribed.

Marple.—The new church dedicated to St. Martin, situated on the Brabins Hall estate, near to the Marple railway station, and erected at the cost of Miss Hudson, of Brabins Hall, has been consecrated by the Bishop of Chester. In the east window are representations of the Twelve Apostles, and in the centre is a representation of the Crucifixion. In a large niche on the north side is an organ, with two sets of keys, cost about 250*l.*, presented by Miss Stevenson, Cotefield, Marple. A new school adjoining has recently been built by Mrs. Hudson, of Brabins Hall.

Crowborough. — The Chancel of St. John's Church has been consecrated. The new chancel is of an oval shape, the roof of wood; it is lighted by five lancet windows of stained glass; that over the altar is by Clayton & Bell, representing the Crucifixion of Our Lord. The windows on either side are also by Clayton & Bell; the one to the left is an effigy of St. Elizabeth, while that to the right represents the patron Saint of England, St. George. The other two windows are of Munich glass. There are other stained-glass windows in the chapel.

Chadlington.—The work of restoration in the church is now approaching its termination, the whole of the nave and chancel being already complete. Many coats of whitewash have disappeared from the walls, pillars, and roof; the ancient gallery has been removed, and an arch opened up into the tower; the ancient lounging boxes, called pews, have given place to modern open seats; the uneven flags in the floor are replaced by red tiles; and instead of the stove, with its yards of pipe, the whole of the church is heated by a combined system of hot-water pipes and hot air, the heat entering the church through gratings in the floor. In the chancel an organ-chamber and vestry have been added to the south side, and two new windows to the north side, the floor being laid with coloured tiles. New choir seats, in carved oak, have also been provided. The architect employed in the restoration is Mr. Buckeridge, of Oxford and London, the details of whose designs have been carried out by a local contractor, Mr. A. Groves, of Milton-under-Wychwood, under the superintendence of the foreman, Mr. Thos. Smith. The cost of this work will be about 2,000*l.*, which sum has been raised from the following sources:—The Earl of Ducie over 1,400*l.*; St. John's College, Oxford, 200*l.*; collected from parishioners, 144*l.*; Diocesan Society, 60*l.*; other contributions, including balance in Churchwardens' hands, 200*l.*

Ipswich.—For many years past the church of St. Mary-le-Tower, Ipswich, has been in the hands of the builders. A townsman resolved some years ago to restore the church in a manner worthy of the great wealth and undoubted art resources of the England of the present day. The works have been carried out under the supervision of Mr. R. M. Phipson, architect. Although the church has been nearly rebuilt, the services in it have never been entirely stopped. When the structural portions of the church were reared the enrichment was one of the portions of the work left for future treatment, and the corbel-heads, key-stones of the window arches, friezes of the doorways, and dripstone terminations, were put in in blocks, and left to be carved *in situ*. It is this work which has now been finished. The workmen employed are from the studio of Mr. Phyffers, the artist employed for several years past in the restoration of the sculptured work in Canterbury Cathedral. The most prominent amongst these works is in the west doorway, where a carved frieze surrounds the door: it represents the vine leaves and fruit upon a circular bole with here and there a bird, as accessory to foliage. On each side of the doorway there springs a crocketed pinnacle, having three grotesque animal forms at each of their bases. The south doorway in the tower is enriched by carved heads of the Queen and the Bishop of the diocese, as dripstone terminations: the former of these is on the west side, and the latter opposite. The inner door has a representation of the Annunciation in the angel Gabriel with uplifted finger, on one side, and the Virgin on the other. The capitals from which the mouldings spring have representations of the bramble and thorn. Over the turret staircase door is a corbel with columbine foliage, and a carved grotesque animal. In the interior of the church the principal carvings are the corbels for the springers of the nave of the roof. These represent the English saints, and are carved on a scale sufficiently large to show the features, and the minutest emblems. They are Saints Alban, Augustin, Oswald, Ebba, Etheldreda, Chad, Cuthbert, the Venerable Bede, Swithin, Edmund, Alphege, Edward the Confessor, Anselm, and Hugh. Between each of these is a foliage corbel. In the north and south aisles are corbel heads representing angels with musical instruments, or in acts of adoration; and here, again, these are alternated with foliage corbels, the thorn, oak, rose, ivy, dahlia, primrose passion-

flower, arum, columbine, and other plants, being represented. Nearest the chancel are the heads of the four Evangelists. The style of the work is the Decorated, but much modernised in some details.

DISSENTING CHURCH BUILDING NEWS.

Ipswich.—The memorial stone has been laid of the new building now in course of erection for the accommodation of the English Presbyterian Church, which has been formed in Ipswich within the last two or three years. The site is on the Burlington estate, with a principal frontage on the wide open space at the junction of the Norwich and London roads, and also having frontage on Mill-lane and the Burlington-road. Mr. Frederick Barnes is the architect. Mr. H. Luff is the contractor, the amount of the contract being 2,897*l*. The walls have reached a height of upwards of 20 ft., and the delay in laying the memorial stone has arisen from the circumstance that the arrangements of Sir A. S. Adair, who undertook to perform the ceremony, did not permit of his being in Suffolk before. The church stands east and west, and consists of what, in Episcopalian architecture, would be called a nave, with an apse at the western end, in which will be the platform for the minister, 78 ft. in length, and 38 ft. wide, and north and south transepts at the west, giving the building at that part a width of 58 ft. At the north-eastern corner will be a square tower, surmounted by a spire of Bath stone, rising to a height of 125 ft. from the ground. It is proposed that a clock should be placed in the upper part of the tower facing the barrack corner. The walls are faced with Kentish rag stones, with Bath stone-dressings, and the style of the building is Decorated. At the east end there will be two entrances, one by the tower, and the other by a porch in a corresponding position on the south side; while in a turret at the north-west corner of the tower is an entrance and circular staircase leading to the gallery across the east end of the church, the first floor of the tower forming a lobby to the gallery. There are also entrances to the floor of the church at the west end, and both there and at the south-eastern porch separate entrances and staircases are provided, which will give admission to north and south galleries if added at any future time. The roof will be open, with double hammer-beams and arched principals; the height from the floor to the ceiling (the small space between which and the apex of the roof will be used for ventilating purposes), will be 40 ft. The eastern gable will be 56 ft. high to the top of the pinnacle with which it will be surmounted, and the gables of the porches will be 20 ft. high. The platform for the minister will be in the apse at the west end, beneath it being a small room which will be used as a vestry, and which will communicate by a staircase with the platform. The church will be benched, and there will be sittings for upwards of 500 persons, and should further accommodation be required, side galleries can easily be added. The roof will be divided into three bays, the walls being supported externally by buttresses in corresponding positions to the principals of the roof. In the north and south walls there will be three two-light windows, broken by transomes as a relief to their height. In the eastern gable will be a five-light window, with three single-light windows below it, and in the transept gables will be two three-light windows resembling those in the north and south walls. Ample apparatus for warming the church is to be provided. Mr. Barnes's plans include school-buildings, having a frontage on Burlington-road, but for financial reasons these at present are not to be carried out. A school-room, 22 ft. square, with four class-rooms, is contemplated on the ground floor, and a large room over, on the first floor, available for school and church purposes. These rooms are to be in communication with the church, and a vestry will also be provided.

New Hampton (Middlesex).—The new Congregational Church here has been opened for divine service. The ground was the gift of two ladies, and has a depth of about 106 ft., and a frontage of 66 ft. to the road between Twickenham and Hampton, giving sufficient area for the erection of church and schools. At present the former only has been undertaken. In a limited competition of architects, the plans by Mr. Benjamin Tabberer were selected. The church is in the Gothic style of early character, and is of brick, with Bath stone dressings, bands of red brick and blue Bath stone being occasionally introduced. The internal dimensions are 56 ft. 10 in. by 35 ft. 11 in., with a porch in front 23 ft. 8 in. by 5 ft. 6 in., vestry in rear 13 ft. by 10 ft., &c. The height from ground to ridge of roof is 44 ft. The edifice contains sittings for 312 persons, but as it is 18 ft. high on the side walls above the floor line, there is sufficient space to admit of the erection of an end gallery to contain 100 more if found desirable. The principal front has a large four-light traceried window, and a spirelet covering the gable, which latter serves also as a ventilator to the church. The porch has two entrances, and a three-light window between. The side windows are of two lights with cusped heads. At the end of the church, above the pulpit, is a quatrefoil circular window, proposed to be filled with stained glass as soon as funds will permit. The roof is open-timbered and stained. The seats are open benches stained and varnished. The pulpit or platform is of ornamental character, and approached by stairs at each side. The building will be warmed by two of Gurney's Gill stoves placed nearly in the centre of the side walls, and lighted by star burners suspended from the principals of the roof. A dwarf wall with ornamental iron railing and gates separates the ground from the road. The contractors for the works were Messrs. Dove. The total outlay will be about 1,500*l*.

Southsea.—The memorial-stone of a new Congregational Church for Southsea has been laid, on an open site on the common. The church, which will accommodate upwards of 670 persons, will consist of nave lighted by clearstory, east and west aisles and transepts, and an apse. Arrangements for the organ-chamber have been made on the east side. The walls will be of Isle of Wight bricks and hammered flints, with Bath stone dressings; internally with red and white brick bands and quoins, and the intermediate spaces being stuccoed. The north entrance, facing the Kent-road, will have a portico attached to the tower and spire, the foundations of which only will be put in at present. There will be two other entrances on the east side. The design is Early English, of the latter part of the thirteenth century. Schools and vestries adjoining the south side were erected two years ago. Mr. Stent, of Warminster, is the architect. Mr. A. Smith, of Portsea, the contractor.

Launceston.—A new Wesleyan Chapel has been opened here. The edifice in style is Gothic, of the geometrical period, and it consists of a nave, side aisles, transepts,—with organ-chamber in one of them,—and a small apsidal chancel. The aisles are divided from the nave by pillars and arches, which support a clearstory, pierced by two-light windows on either side. At the north-west angle and detached from the main structure is the tower, which, with its spire, rises to the height of about 110 ft. The principal front towards the street presents the triple doorway of an open and recessed porch, the openings separated by grouped pillars of polished Aberdeen granite, from the carved capitals of which spring pointed and moulded arches of Cornish grey granite. Over this doorway is a large four-light window, with clustered pillars between the lights and at the jambs, and moulded tracery in the head. Above this rises a gable coped and pinnacled. The aisles have sloping roofs, and are lighted by series of two-light windows. The transepts terminate with gables pierced by three-light windows. Each of the three sides of the chancel has a two-light window, with detached pillars having carved capitals, and filled in with stained glass of geometrical pattern by Bell, of Bristol. All the other windows are filled with cathedral glass. The chapel will seat about 700 persons in open pews, constructed of pitch pine, and there is a small gallery for children at the north end. The chancel and all the passages are paved with Maw's tiles; and the walls of the former to the height of 3 ft. are also lined with tiles of chocolate colour and encaustic band in which the passion flower is conventionally introduced. Between the tile dado of the chancel walls and the window sills, the wall surface is to be painted in panels from the architects' designs by Mr. Harris, of Plymouth, but this portion of the work is not yet completed. Here also will be introduced the decalogue and texts. All the roofs are open to the collar-beam. The walls of the structure are built of local stone, Bath stone, Portland stone, and granite, and the angles of the spire are of wrought limestone. The carving, which is conventional, has been done by Mr. Harry Hems, of Exeter. The Plymouth Foundry supplied the ornamental castings for the gallery front. The general contractors were Messrs. Blatchford, of Tavistock; and the architects, Messrs. Hine & Norman, of Plymouth. Adjoining the chapel are a large school-room, infant school, six class-rooms, and minister's vestry; and in these portions of the works the stone dressings from the former chapel have been to some extent introduced, which will account for a difference in the style of the church and school buildings.

Books Received.

Handbook for Shropshire, Cheshire, and Lancashire. London: JOHN MURRAY, Albemarle-street. 1870.

MR. MURRAY has increased the obligations due to him from the travelling public and the inhabitants of the counties illustrated, by the publication of this guide to Shropshire, Cheshire, and Lancashire,—counties that include a vast deal of interesting matter. The preface says justly that a handbook which embraces such a large section of England as this does, extending from the South Welsh mountains to those of Cumberland, from the Severn nearly to the Solway, must needs contain some inaccuracies, and especially in the manufacturing districts, where changes occur so much more rapidly than in others. The editor asks, therefore, for any additions or corrections that can be afforded him. Dipping here and there into the book, we find his fears are not wholly without ground, and that the next edition may be improved by careful review of this. Amongst the slips are some architectural errors, such as the statement touching Furness Abbey, that the style of the abbey "was Early English; but as additions were made to it, as its wealth increased, it gradually assumed a mixed character, known as Transition;"—"the *Town-hall* at Manchester is after the Erechtheus at Athens," and so on. Liverpool architects will be surprised to find the *Custom-house* there instanced as one of the noblest architectural works of the age (p. 259), it being one of the dreariest masses of dead-looking ashlar work that can be imagined. The *Exchange* is described as being "much altered and enlarged by Wyatt" (p. 260), and "Wyatt" also is named as designer of the Nelson monument: with nothing to show that they are not the same man, and that the Exchange is a *new* building. The statement (p. 256) that in gales the steamboat communication with Birkenhead is stopped is erroneous, except in very rare cases: an old inhabitant tells us during fifteen years' dwelling on the Cheshire side he only remembers the traffic once entirely stopped, and that was by a *fog*, and was censured as showing unnecessary timidity on the part of the ferry managers.

It may be worth mention that the *Gallery of Art* (p. 261) was pronounced by Waagen to be one of the finest and most interesting collections of *early* painting in the world. The tympanum of the great portico of St. George's Hall is said to have "a group of figures in Caen stone, by Cockerell." It should be *designed* by Cockerell.

The remarks about Chester and Birkenhead seem very full and correct in the main. St. Mary's, Birkenhead, was one of Rickman's designs, which should be mentioned. Hamilton-square (Birkenhead) is much over-praised; people are giving up their houses there now to go up to the suburbs (*Claughton*, and *Oxton*, and the Park). No mention is made of the Claughton district on the rising ground about a mile and a half from the river, which is one of the pleasantest residential suburbs we know of anywhere near a large town, and has some capital houses.

In the account of Manchester we find no mention of the Albert Memorial there, precursor as to form on a small scale of the remarkable piece of monumental jewelry in Hyde Park, now approaching completion; and it would be as well in speaking of the memorial groups in front of the Royal Infirmary, to give the names of the sculptors. And as to names, we miss in the interesting list of "celebrated men who have been born in or are identified with the history" of Lancashire, that of Richard Cobden. Passing to Haughmond Abbey, Shropshire, the figures in the jambs of the Norman doorway should not be described as "*placed* there subsequent to the building of the arch," but as *sculptured* there. We would add some other notes, such for example that in the account of Todmorden (Lancashire) no mention is made of Dobroyd Castle, the residence of Mr. John Fielden, but it might seem that we were seeking to pick holes, which in truth is not the case.

The guide-book commences with some very

useful introductory essays on the physical geography, geology, industrial resources, means of communication, history, and antiquities of the three counties, with lists of the various places of interest deserving a visit, and skeleton tours to be varied according to pleasure.

VARIORUM.

Hardwicke's *Science Gossip* continues to bring much interesting and curious matter before the lovers of nature. The November number contains information as to the Birds of Paradise, the eggs of butterflies, with curious illustrations, and various other interesting matter.——"Elementary Arithmetic: part II. By Richard Rickard. Cassell, Petter, & Galpin." Mr. Rickard ought to be a competent writer on arithmetic, as he seems to be, for he is assistant mathematical master in King Edward's School, Birmingham. ——"Some Points in the Physiological and Medical Aspect of Sewage Irrigation. By Alfred Carpenter, M.D. Hardwicke, Piccadilly." This is a second edition of a paper read at the Social Science Congress, at Bristol, in October, 1869; and contains notes on the recent evidence adduced against irrigation in the Houses of Parliament, &c., to which is also appended a paper on the influence of sewer gas on the public health. A desire for further information upon the effects of sewage irrigation in the neighbourhood of Croydon, has led to the revisal and republication of Dr. Carpenter's paper. —— "Cardiff Free Library, Museum, and Schools of Science and Art. Eighth Annual Report, 1869-70." The number of issues from the Cardiff library during the year has been 17,871 volumes, which shows that there has scarcely been any increase upon the issues of last year. The result is due to the small number of new works added, and the want of a proper catalogue. The rapid growth of the Schools of Science and Art has necessitated their removal from St. Mary-street to the Cardiff Arcade, where commodious rooms have been rented. ——The Palestine Exploration Fund managers have issued a preliminary report of a journey through the desert of the Tih and the country of Moab, by Mr. E. H. Palmer, M.A. The report is mainly promissory, however, as well as preliminary. Mr. Palmer intimates that he and Mr. Drake may be said to have performed their journey absolutely unattended and alone. They went to Dhibàn, and searched carefully among the broken fragments of the Moabite stone which are still lying there; but every piece with writing on has been either destroyed or removed. Mr. Palmer tells a curious and romantic legend connected with Jerusalem:—

"It is a curious fact that the guardian of the Aksa Mosque (whose ancestors once had the care of the entire Haram, until they were supplanted by the Denef family in the custody of the Cubbetes Sakhrá) declares that his father, when dying, indicated to him a spot within the sacred enclosure where an iron chest full of ancient books lies buried, and adds, that from the oldest times each successive sheikh has revealed the fact to his son as the ay of his death drew nigh."

As Mr. Palmer remarks, valuable books have been so preserved for centuries in the East. The ancient Jews also buried rolls of the law in earthen pots for safe keeping. He thinks the Palestine Fellahin should be talked to as to such matters. Mr. Drake supplements the report with remarks on the stone circles of Ragb el Mirad. Similar enclosures, he says, are still in use as foundations for thorns as hedges surrounding camps, to keep out the wild animals.

Miscellanea.

New Brewery, Swindon.—A new brewery is in course of erection, constructed, it is said, upon very economical and scientific principles. It stands near the High-street, and covers about 2 acres of land. It is capable of brewing over 2,000 gallons daily, with only one engine and one boiler (double flue: 14-horse power), which consumes not more than half a ton of slack per day. The building throughout was undertaken by Mr. Phillips, of Swindon, who worked from the architectural designs of Mr. Arthur Kinder, of London. The machinery was constructed by Mr. Llewellyn, of Bristol; and the vats, &c., were made by Mr. Oxley, of Frome, and Mr. Bridle, of London. The brewery has now been finished, and a supper has been given by the proprietor, Mr. Bowly, at the Masons' Arms Inn, to the whole of the men that were engaged in its erection, together with a few friends.

Edinburgh Architectural Association.—At the first ordinary meeting of the session, held on the 13th ult., Mr. Thomas Ross, vice-president, in the chair, the President for the current year (Mr. R. Morham, jun.) read a paper "On various Defective Internal Arrangements of Dwellings." He referred at some length to the subject of the ventilation of dwelling-houses, pointing out that, while it was usual at the present day, in the case of most public buildings, to make some provision for this important function, in the case of dwelling-houses it was most frequently quite overlooked, and made to depend very much on the want of fitting about doors and windows; and then went on to show that it was not enough for the architect that his employers were indifferent to such matters, but that it was his duty in all cases to endeavour to impress on them the duty of giving effect as far as possible to the dictates of modern scientific research, and that the mere indifference to the importance of proper ventilation was no reason why it should not be pointed out by him on all occasions as a very necessary thing. One subject referred to was that of water supply, or rather the waste of water, which, he thought, could most effectually be checked by the use of meters, but admitted that there were serious difficulties in the way of their introduction. The question as to the best kind of water-tap, and the case which was tried in the Sheriff Court a few years ago, wherein the relative merits of the ground-plug and screw-down principles were very fully discussed, were then alluded to, and a portion of the evidence in that case was quoted to show that in the towns of Manchester and Norwich the introduction of the screw-down tap had reduced the quantity required per head per day from 38 or 40 gallons to from 13 to 15, which was found amply sufficient for all domestic purposes.

Instruction in Science and Art for Women.—Professor Huxley delivered the sixth of his series of lectures on "Physiography" to a numerous audience in the lecture-room of the South Kensington Museum, on Saturday morning, when he continued his observations on the plutonic and vital agencies that are at work in repairing the waste of dry land which is constantly going on in the various forms of denudation previously described. The seventh lecture was delivered on Wednesday. There was a numerous attendance. The lecturer continued his observations on the "vital" as distinguished from the "plutonic" agent at work in repairing the waste of dry land occasioned by the various forms of denudation. Professor Guthrie delivered the fourth of his advanced course of lectures on heat and light, in the lecture theatre. Having in his previous lecture spoken of the capacity of heat in different substances, the Professor now proceeded to consider how it is that some substances have greater melting powers than others, as was previously illustrated, to some extent, in the melting of wax by bringing up the different substances to the melting degree of temperature; and how it happens that different substances having the same temperature may not possess the same amount of heat. The fifth lecture of his series proceeded to examine and illustrate still further the subject of heat. The first object of illustration was ice, upon which some interesting experiments had been made in the course of the preceding lectures.

A City Lighted by Natural Gas.—The city of Erie, Pennsylvania, stands on the verge of the petroleum region. Natural gas is formed in large quantities beneath the surface in this region, and it has been turned to account for illuminating purposes. On the night of Oct. 26 the city of Erie was lighted by natural gas, obtained from a well sunk near the city gas-works. Thirteen gas-wells are said to be now in successful operation in Erie, and are mostly used to furnish fuel and light to factories. The gas is found at an average depth of 550 ft., and the yield per well is about 20,000 cubic feet a day. The gas is said to require no purification, and is being introduced into private houses for fuel.

A Church Spire Damaged.—The village of Hartfield has been visited by a severe thunderstorm, which did serious damage to the church. The lightning struck the ball at the top of the vane, split the top of the spire, ripped out the shingles and some of the timbers on the south side, and some of the stones on the top of the tower. The whole of the spire, in fact, is so severely shaken, that much of it will have to be removed before it can be repaired.

Lectures by the Rev. Canon Kingsley. The extraordinary cerebral activity of the Rev. Canon Kingsley may be slightly appreciated by an announcement which he lately made before delivering a lecture, at Chester, "On Wind and Rain." "I wish, next spring, to give to those who did me the honour of attending my botanical class last spring, some plain lectures on geology; but not merely on geology. As I said last night at Liverwool, you cannot study one natural science without being forced to study at least a little of three or four more; and therefore I should prefer calling those lectures, lectures on natural history, that is, the history of our planet; at least, the history of its surface, on which we live; lectures on what the Germans call *Erdkunde* —earth-lore, earth learning which I hope to see some day taught in every school in the British empire. I think of giving a set of lectures on the very simplest matters; to begin, I think, with the soil in the field; then go on to the cobbles in the street, to the stones in the wall, the coal in the fire, the lime in the mortar, the slates on the roof; and so to lead you (as I ought to be able to do) through the whole geology of this district. And meanwhile, it is fit that I should give you, as an introduction to these lectures, a little talk about wind and rain; for, as you will see, I hope, in time, to show that without wind and rain there would have been no soil, no cobbles, no sandstone, no coal, no lime, and no slates, and (as I may show you in some future course of lectures) no reptiles, animals, or men either. Let us begin with the wind."

Parliamentary Bills.—Amongst the Bills in Parliament Session 1871, will be one for purifying the water and giving a constant water-supply to London, for the control and regulation, amalgamation, &c., of the several companies, reduction of rates, and other cognate purposes. There will be a Bill for the enlargement of Billingsgate Market, purchase of adjoining land, &c. Another Bill is for the acquisition of additional ground, &c., for the Record Office in the Liberty of the Rolls. There is a Bill titled the "Euston, St. Pancras, and Charing-cross Railway," for the construction of railways from the London and North-Western Railway at Euston Station and the Midland Railway near St. Pancras Station to the Charing-cross Railway at Charing-cross, and streets between Oxford-street and Leicester-square, and between Leicester-square and Castle-street. Another for the incorporation of the "Fulham, Hammersmith, and City Railway" Company, for a line commencing with a junction with the Hammersmith and City Railway, in the parish of Hammersmith, near the Hammersmith Terminus, and terminating in the parish of Fulham, at a point on the northern side of the King's-road, where the tablet bearing the inscription "Elysium-row, Anno Domi., 1738," is let into the front of the houses.

Sanitary State of Wells.—For some months past an agitation has been going on about the necessity of the local board obtaining a better supply of water. The board refused to do so, but sanctioned the formation of a private company, of which General C. C. Pratt is the chairman, and Mr. Welsh the solicitor. Before this consent had been given by the board, a memorial (in pursuance of the 49th section of the Sanitary Act, 1866), was signed by several of the principal owners and ratepayers, praying inquiry as to the default of the local board. An inquiry has accordingly been directed to be made, the commissioner appointed for the purpose being Mr. Arnold Taylor, who intends to proceed upon the said inquiry on the 15th instant, at the Town-hall, Somerset.

The Property of the Metropolitan Railway Company.—In reply to the offer of premiums by the Company for the best plan for utilising their surplus property, about 300 plans were submitted. The lands are at Farringdon-road, Barbican, King's-cross, Bagnigge Wells-road, Edgware-road, Praed-street, Linden-grove, Campden-hill, Smithfield, and South Kensington. The Farringdon-road estate is valued at about 350,000l., and that of Smithfield at 150,000l. We do not hear that any decision has yet been come to.

India.—An archæological committee has been appointed in Ceylon to investigate the ruined sacred cities, and to collect inscriptions. Several ancient cities have been cleared of jungle, and many unknown antiquities have come to light. Photographs have been taken of the ruins of Anuradhapura.

Public Hall for Harrow.—It is proposed to form a joint-stock company, under the Limited Liability Act, for the purpose of erecting a public hall in Harrow. A site in the High-street, nearly opposite the King's Head Hotel, has been secured on advantageous terms, at a ground-rent, with the option of purchasing the freehold within a period of seven years. On the first floor of the building, according to the design, are the main hall, with gallery, capable of seating 600 persons, orchestra, platform, two retiring-rooms, ladies' and gentlemen's cloak-rooms, and also a refreshment or club room. On the second floor are four rooms for the use of an attendant, &c. The estimated cost of the building, including architect's charges for plans and superintendence, is 2,000*l.*, which it is proposed to raise in 2,000 shares of 1*l.* each, 5*s.* per share being payable on allotment (on the formation of the company), and the remainder by instalments as required.

Danger from Union of Metals.—Some time ago, at the Institution of Engineers in Scotland, Mr. Clinkskill exhibited several pieces of boiler plates cut out of destroyed boilers for supplying houses with hot water; the boilers were used with Loch Katrine water. The action on the plates was evidently due to a more active agent than ordinary corrosion, the surface of the plates being irregularly honey-combed to a considerable depth. In the case referred to, the cistern was of lead, the boiler and connecting pipes of iron, thereby forming a galvanic battery, sufficient to account for the destruction of the plates. From the experience obtained, it appears advisable that in the construction of such hot-water apparatus, the cistern, boiler, and the connecting pipes should all be of iron, or, at least, of one kind of material.

New Altar Space in York Cathedral.—A new altar space has been erected in the sanctuary of York Minster. In length it is 17 ft. 6 in., and in breadth 6 ft. 6 in., and it is erected immediately adjoining the stone altar-screen. The framework or step has a rise of 8 in., and is of white Sicilian marble. The entire area within is laid down with encaustic tiles and coloured marbles, that portion upon which the altar-table rests, and which is not exposed to view, being of plain maroon-coloured glazed tiles. The marbles used are Egyptian green, Belgian red, Sienna, Silesian, and white statuary. The designer is Mr. Street, and the execution of the work has been completed by Mr. Earp.

The Wellington Monument, St. Paul's. We hear, with equal surprise and regret, that the Chief Commissioner is inviting tenders from sculptors for the completion of Mr. Stevens's monument. It is impossible wholly to exonerate Mr. Stevens from blame in this matter; but to suppose that any one but himself can satisfactorily complete his work is nonsense, and we suppose few sculptors will be found willing to attempt it. When Dickens died, leaving his last book unfinished, Chapman & Hall might as well have advertised for some one to finish it. A proper arrangement ought at once to be made with Mr. Stevens himself.

Kind Feeling.—An interesting meeting took place on Friday evening, November 24th, at the Sun Inn, Westminster Bridge-road, when the masons working at the new St. Thomas's Hospital presented to their head foreman, Mr. James Williams, a handsome case of mathematical instruments, as a testimonial of their esteem and appreciation of his abilities and upright conduct whilst carrying out the work, and for his general candid manner with the men under him. Such recognitions are honourable to all concerned.

Entertainment.—Mr. A. Bell (of the firm of Clayton & Bell), of Bayford House, Hampstead, entertained, on the 22nd ult., some twenty workmen engaged with Mr. W. H. Watts in erecting an ornamental addition to the house, under the superintendence of Mr. Charles Buckeridge, architect. A repast, at seven o'clock, was partaken of with acknowledgment, after which toasts and harmony filled up a pleasant evening.

Knighted Architects.—The expected addition to the list has been made. On Tuesday last her Majesty the Queen conferred the well-deserved honour on Mr. Pennethorne. We heartily congratulate Sir James Pennethorne on this recognition of his services, and with sincerity wish him long life to enjoy his retirement.

The Victoria Embankment.—The approach to the Victoria Embankment by way of Arundel and Norfolk streets, Strand, has, after considerable delay, been completed so far as to admit of its opening in a few days from Arundel-street, which is now being repaved with the view of facilitating the access from that street.

Penrith.—A meeting has been held with a view to building a covered grain-market for Penrith. Arrangements were made to learn the opinions of the Duke of Devonshire on the subject.

TENDERS.

For No. 1 Contract for sugar refinery, Love-lane, Liverpool, for Messrs. Henry Tate & Sons. Mr. W. J. Mason, architect. Quantities by Mr. G. Northcroft :—

Kirkham	£5,467	0	0
Litt & Wilkinson	5,279	0	0
Tomkinson	4,968	0	0
Readdil	4,966	0	0
Nicholson & Ayre	4,867	0	0
Burroughs	4,862	0	0
Roberts & Robinson	4,730	0	0
Holme & Nicol	4,727	0	0
Urmson	4,704	0	0
Rome	4,657	0	0
Haigh & Co. (accepted)	4,637	0	0

For an Ionic temple and terraces, and works to ornamental grounds, at the seat of the Earl of Strafford, Wrotham Park, Herts. Messrs. Shrubsole & Stewart, architects :—

Goddard (accepted)	£922	0	0

For Waterloo-wharf, stables, counting-houses, &c. Mr. G. Loe, architect :—

Hill, Keddell, & Waldram	£1,850	0	0
Marsland & Son	1,650	0	0
Conder	1,597	0	0
Manley & Rogers	1,537	0	0
Woodward	1,509	0	0
Henshaw	1,497	0	0
Crabb & Vaughan	1,494	0	0

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We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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THOMAS BEASLEY, Law Clerk.
St. Helen's, 10th November, 1870.

ROAD FOREMAN WANTED.—The Board of Works for the Wandsworth District are desirous of receiving applications from competent persons for the Office of ROAD FOREMAN, in the parish of Clapham, at 2*l.* per week wages. The duties to be performed can be ascertained on application to Mr. W. E. LACEY, the Parish Surveyor, at his Office, Old Town, Clapham, between the hours of NINE and TEN a.m. The person appointed will be required to devote his whole time to the duties of his office, and to reside in the parish.—Applications to be sent in to the Office of the Board, Battersea-rise, in the candidate's own handwriting, endorsed "Application for Office of Road Foreman," on or before TUESDAY, the 13th inst. No person above forty years of age need apply. By order of the Board of Works for the Wandsworth District.
ARTHUR ALEX. CORSELLIS, Clerk to the Board.
Battersea-rise, S.W. December 1, 1870.

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WANTED, by a very steady Man, a SITUATION as CARPENTER and JOINER on a Gentleman's Estate. Thoroughly understands his business, and is a genuine staircase hand. No objection to make himself otherwise useful. Understands plans, &c. Wages moderate.—Address, P. S. Post-office, Sandwich, Kent.

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